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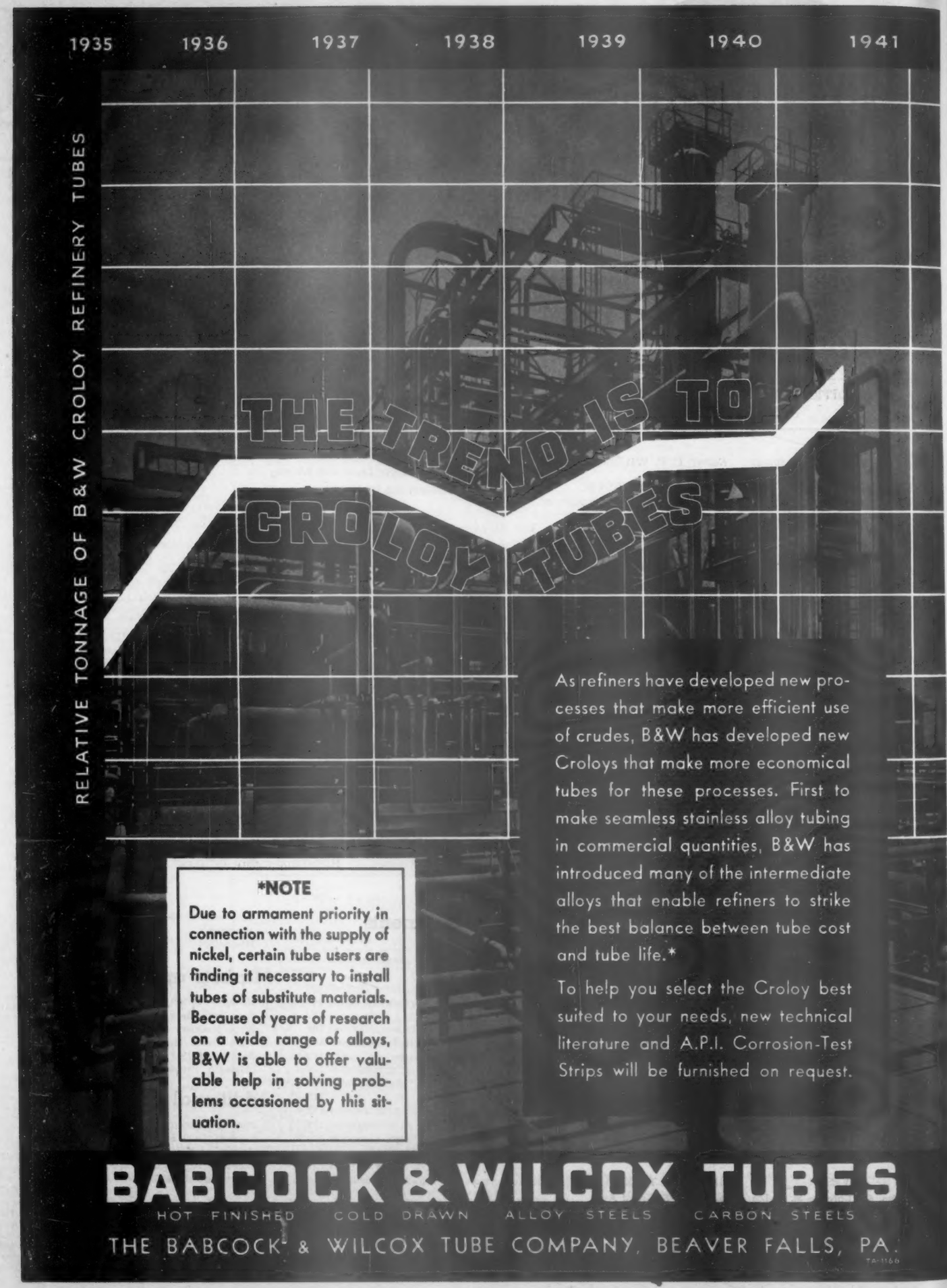

As refiners have developed new processes that make more efficient use of crudes, B&W has developed new Croloys that make more economical tubes for these processes. First to make seamless stainless alloy tubing in commercial quantities, B&W has introduced many of the intermediate alloys that enable refiners to strike the best balance between tube cost and tube life.*

To help you select the Croloy best suited to your needs, new technical literature and A.P.I. Corrosion-Test Strips will be furnished on request.

***NOTE**

Due to armament priority in connection with the supply of nickel, certain tube users are finding it necessary to install tubes of substitute materials. Because of years of research on a wide range of alloys, B&W is able to offer valuable help in solving problems occasioned by this situation.

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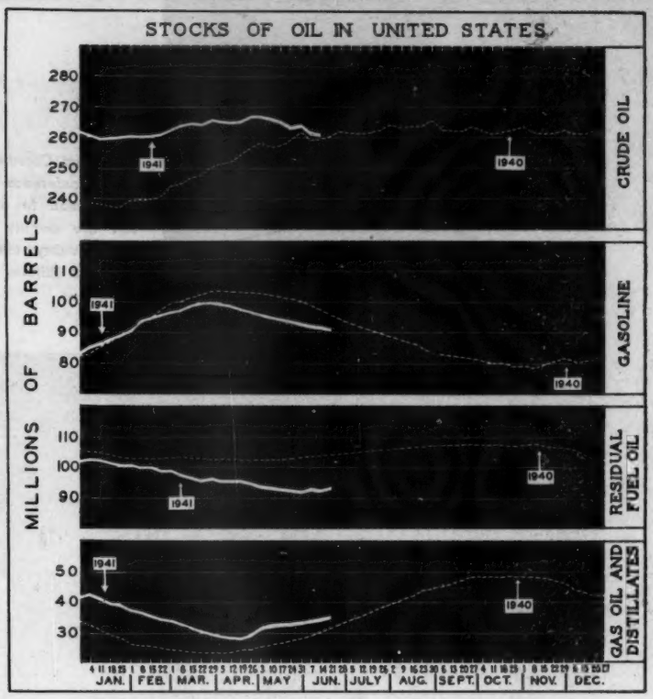
Trends

East Coast Crude Stocks Signal for Speedup on Lines



A REDUCTION of 187,000 bbl. in the crude-oil inventories held by East Coast refiners during the week ended June 14 appears to be one of the first statistical straws to indicate extent of the coastwise transportation shortage. Crude stocks for the entire country declined 492,000 bbl., a reducion of 8 per cent. The East Coast suffered 38 per cent of the total national decline in crude inventories for the week. On the basis of recent runs to stills of East Coast refineries averaging 558,000 bbl. daily, the June 14 stocks of crude in that area represent 21 days' supply compared to an aboveground reserve of 69 days' refinery operations for the entire country.

Crude inventories dropped to a supply for only 19 days' refinery operations at the rate of runs to stills prevailing on April 1 but this was toward the end of the fuel-oil season following an extended period of using most available dirty tankers for coastwise movement of burning products. A year ago, when East Coast refinery runs averaged 564,000 bbl. daily, crude stocks there at the end of June totaled 16,624,000 bbl., or 29 days' supply. Refiners throughout the nation at that time were running 3,491,000 bbl. daily and total crude stocks represented reserves for 75 days.

CRUDE PRODUCTION *3,864,145 bbl. daily average—up 29,925 bbl. One year ago 3,845,387 bbl.*

CRUDE STOCKS *260,464,000 bbl. as of June 14—down 492,000 bbl. One year ago 259,800,000 bbl.*

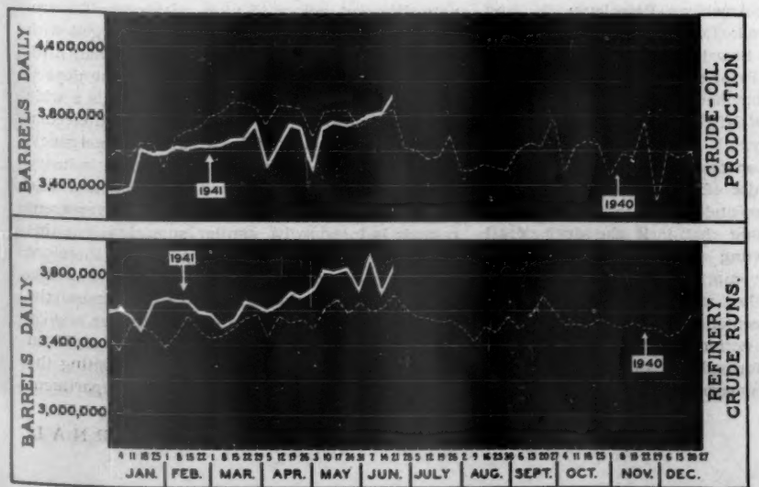
GASOLINE STOCKS **91,916,000 bbl. as of June 21—down 562,000 bbl. One year ago 95,999,000 bbl.*

RESIDUAL FUEL-OIL STOCKS *93,281,000 bbl. as of June 21—up 99,000 bbl. One year ago 104,021,000 bbl.*

GAS OIL AND DISTILLATES *35,736,000 bbl. as of June 21—up 676,000 bbl. One year ago 31,797,000 bbl.*

REFINERY RUNS *3,845,000 bbl. daily week ended June 21—up 90,000 bbl. One year ago 3,690,000 bbl.*

*Includes 7,243,000 bbl. aviation motor fuel, down 249,000 bbl. One year ago 5,350,000 bbl.



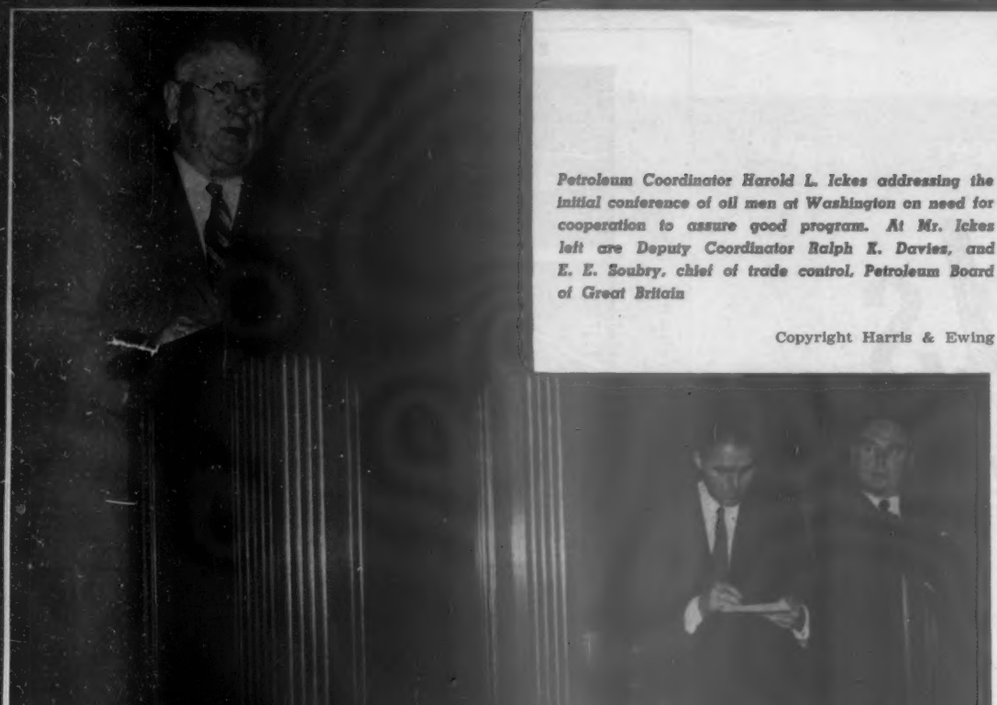
The conclusion must be drawn from the relatively stable position of East Coast crude stocks as related to remainder of the country that transportation conditions have not yet reached a critical stage. The relatively sharp percentage reduction of crude stocks on the East Coast in the second week of June may be a danger signal. The position of crude stocks there will be one of the indices by which to gage the industry's success in combating the transportation problem created by forces beyond its control.

DAILY AVERAGE PRODUCTION FOR WEEK

	June 21, 1941	Bur. Mines June est. of demand	June state allowables	June 14, 1941
Arkansas	72,860	83,000	73,612	73,4°0
California	640,150	615,300	575,000	649,225
Eastern fields	112,500	122,300	.....	112,500
Illinois	343,005	345,300	.....	342,845
Kansas	231,450	220,400	232,400	218,550
Louisiana	331,910	319,700	319,500	322,250
North Louisiana	*77,660*	.....	.....	*74,900*
Louisiana Gulf Coast	*254,250*	.....	.....	*248,250*
Michigan	40,200	38,000	.....	38,050
Mississippi	28,015	23,300	.....	29,100
Nebraska	4,400	4,300		4,450
New Mexico	113,870	113,000	113,000	113,210
Oklahoma	414,125	459,700	415,000	415,550
Rocky Mountain states	109,460	114,000	.....	109,090
Texas	1,422,200	1,371,700	1,362,280	1,406,000
East Texas	*373,200*	.....	.....	*373,400*
West Texas	*262,950*	.....	.....	*261,900*
North Central Texas	*132,350*	.....	.....	*129,500*
East Central Texas	*80,600*	.....	.....	*79,650*
Texas Panhandle	*81,150*	.....	.....	*74,300*
Texas Gulf Coast	*397,550*	.....	.....	*393,050*
Southwest Texas	*94,400*	.....	.....	*94,200*
Total United States	3,864,145	3,830,000	.....	3,834,220
Total production, Jan. 1-June 21, 1941		604,366,830 bbl.		
Same period last year		621,874,403 bbl.		

The anticipated opposition of railroads to the proposed construction of defense pipe lines to the East Coast developed this week in Washington. Still, there is no change in the previous indication that Senate approval will be given, the last step necessary to send the Cole bill to the White House.

Final discussions are taking place this week on the industry's part in construction of one or more lines. There are minor points to be adjusted between the participating companies over the size and route of the line but they appear to be problems that can be adjusted without difficulty. Then, the industry's preparations will be complete and it will be up to Washington to enact the Cole bill upon which the entire East Coast petroleum-supply question now hinges. Confidence is growing that the supply problem will be solved without resort to curtailment of consumption on the East Coast.



Petroleum Coordinator Harold L. Ickes addressing the initial conference of oil men at Washington on need for cooperation to assure good program. At Mr. Ickes left are Deputy Coordinator Ralph K. Davies, and E. E. Soubry, chief of trade control, Petroleum Board of Great Britain

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At last week's conference in Washington, Mr. Ickes evidenced a very definite desire to cooperate rather than dictate, when he addressed the oil men who had been invited to the conference. Plans were announced for appointing administrative committees representing different divisions of the industry and sections of the country. The Justice Department gave assurance that before it took any action against the industry it would consult the coordinator.

Ickes Gains Industry's Favor At Washington Conference

By HENRY D. RALPH

WASHINGTON, D. C., June 24.—Harmony, good will, and mutual pledges of understanding and cooperation marked the general conference of the oil industry with Harold L. Ickes, secretary of the interior and petroleum coordinator for national defense, here last Thursday.

Very little in the way of a definite program was outlined, but Secretary Ickes asked for the help and advice of the industry, and men from all branches of the industry promised to give assistance, make sacrifices, and cooperate with whatever program is developed.

Beyond this, the conference served the very useful purpose of quieting fears and rumors which have troubled the oil industry for some weeks—fears that Ickes is about to impose a dictatorial "crackdown" control system; that the British do not need the 50 tankers, transfer of which has so disrupted the oil business; that the antitrust laws stand in the way of any cooperative action; that an arbitrary system of price control is imminent; that the various branches of the government affecting the oil industry may work at crosspurposes; that certain elements in the industry would be favored at the expense of others.

Aside from quieting such fears, the chief definite bit of information announced at the conference was that administration of the coordinator's office is to be decentralized to five regions, with headquarters yet to be selected, each with a small staff and four industry committees dealing with production, refining, transportation, and marketing. The industry is to make nominations for these committees, and is asked to submit problems, suggestions, and comments.

More than 600 persons registered at the conference, and virtually all of the 900 seats in the Department of Interior auditorium were filled throughout the day. Those present included presidents of major oil companies, independent producers, refiners, jobbers, retailers, taxicab owners, industrial consumers, motoring organizations, attorneys, state oil-control officials, representatives of several federal agencies, and many other classifications—a representative cross-section of the oil industry and interests concerned with it. They registered from 38 states, the District of Columbia, Mexico, Canada, and England.

Discussion Opened From Floor

No industry men took the platform, but after the formal program, the meeting was opened to discussion from the floor, and more than a score spoke briefly, most of them simply pledging cooperation.

Speakers were Secretary Ickes; Ralph K. Davies, deputy coordinator; Francis Biddle, acting attorney general; G. R. Cottrelle, chairman of the Oil Control Board of Canada; E. E. Soubry, chairman of the Anglo-American Petroleum Co. and director of the Trade Control Committee of the British Petroleum Board; Blackwell Smith, deputy director of the Priorities Division of the Office of Production Management; and Leon Henderson, administrator of the Office of Price Administration and Civilian Supply.

Secretary Ickes opened the conference with a plea for, and promise of, "harmony, cooperation, and a mutual desire and willingness to solve the problems," explaining that it is the duty of all to keep things running smoothly in the industry. The office of petroleum coordinator, he said, is not established by law and therefore its problem is not one of enforcement and is not based on the theory of punitive action; its method will be to keep all parties informed and to work out agreements which all concerned will be expected to follow "on the basis of their honor and because of an urge to help defend their country."

As to his own position, the coordinator declared that he is personally concerned with all petroleum problems, and that he will seek information and advice but will not wait for problems to be brought to him.

Probably because he knew that fears of the antitrust law were foremost in the minds of those present, Secretary Ickes then introduced Solicitor General Biddle, in charge of the Department of Justice since the appointment of Attorney General Jackson to the Supreme Court. Referring to the antitrust suit now pending in the District of Columbia court, he said that while he is not familiar with its details he firmly believes that largely as a result of the creation of the coordinator's office a decree can be worked out to the satisfaction of the industry and the Department of Justice.

As to future actions, the solicitor general made three points. First, Secretary Ickes will coordinate different points of view within the Government; the Department of Justice is charged with the responsibility of enforcing the Sherman Antitrust Act and while he would not say the department would hesitate to enforce it, there is a wide field of discretion in its enforcement and circumstances can be changed by a national emergency. Second, it is an unfortunate fact that an industry regards the Government with distrust and suspicion and also unfortunate that the Government regards industry with similar suspicion, but this is unnecessary and can be avoided. It therefore is Secretary Ickes' task to unite the various points of view, but this should not be hard because the outlook and purpose is to render greater service to the country. He and Mr. Ickes have agreed on a procedure under which proposals affecting the oil industry will be submitted to the Department

of Justice which will give assurance that they are or are not proper, and after that there will be no question about the legality of the action and the proposals can be carried out without fear or feeling. Obversely, before the Department of Justice takes any action it will consult the coordinator. Third, all recommendations or directives of the coordinator are to be reduced to writing, approved by industry committees, and published in the Federal Register, so that everyone may understand them and there will be no misinterpretation. The Department of Justice, Mr. Biddle concluded, wants to cooperate in every way and has complete confidence in the wisdom and vigor of the coordinator.

Mr. Davies then read the texts of letters exchanged by Mr. Ickes and Mr. Biddle outlining the procedure in detail.

The operation of the priorities system was explained by Blackwell Smith, who gave assurance that priorities will be granted for steel to construct necessary pipe lines. The Priorities Division is standing by to fit in with the petroleum coordinator's program and will take no arbitrary action, he said, adding that if priorities are invoked on oil there probably will be a prohibition against supplying heavy fuel oil to any user in the East who could convert his burners to handle coal.

The Canadian oil controller, G. R. Cottrelle, assured the conference that his country is not wasting oil, explaining that it must import more than 86 per cent of its petroleum requirements. He reviewed the curtailment steps taken, starting with prohibition of construction of new service stations and bulk plants until at present no new oil-burning equipment may be installed except in munitions plants.

Britain's need for oil and steps taken to curtail consumption and increase the usefulness of tankers were explained by Mr. Soubry, and while he was unable to reveal any statistics he gave positive assurance that everything possible is being done.

Deputy Coordinator Davies, in a talk outlining some of the problems facing the industry, declared that there can be no real conflict between the basic objectives and responsibilities of government and industry, and that the demand is for teamwork of the highest order. The immediate problem, he said, is transportation, and he predicted that more efficient use of present facilities might add 10 per cent to their capacity. But tomorrow will bring other problems, he warned, and without definitely stating what actions the coordinator's office might take or recommend, he outlined a long list of subjects, from production to marketing, which may be dealt with.

Outline Administrative Setup

SECRETARY ICKES then outlined his proposed administrative setup and asked for suggestions. He proposed to divide the country into five regions, each with a small staff and each containing four industry committees. Headquarters have not yet been selected, nor are the groupings of states final, and both can be adjusted to suit the convenience of the industry. There will be no final decision on any important matter until the industry has had an opportunity to express its views, he declared.

The proposed regions are as follows:

1. The New England states, all states touching the Atlantic Coast, including Florida, and West Virginia.

2. North Dakota, South Dakota, Nebraska, Kansas, Oklahoma, Missouri, Tennessee, Kentucky, Ohio, and all states enclosed by this group.

3. New Mexico, Texas, Arkansas, Louisiana Mississippi, and Alabama.

4. Colorado, Utah, Wyoming, Montana, and Idaho.

5. Washington, Oregon, California, Nevada, and Arizona.

In each region there are to be four industrial advisory committees set up on functional lines and dealing with production, refining, transportation, and marketing. Mr. Ickes asked for nominations for these committees by June 26. He said each committee should be no larger than 12 members, and they should be representative, balanced geographically and as between majors and independents, they should be operating oil men with special abilities in their fields, and should be personally known to the nominators, who should state their qualifications when sending in their names.

The chairmen of these committees will serve as general coordinating committees, and will form nucleus for national or interregional committees.

Henderson Explains Price Policy

THE last platform speaker was Leon Henderson, price administrator, introduced by Mr. Davies as head of one of the 20 federal agencies which he has discovered deal with the oil industry.

A request has gone out to leading refiners and marketers of petroleum products throughout the country not to make any further advances in prices without prior consultation with the Office of Price Administration and Civilian Supply. The letter referred to a recent meeting between refiners and marketers in the northeastern and mid-Atlantic states at which general agreement was reached that no further substantial increases in gasoline prices are called for unless basic conditions change. The letter continued:

"We request your company not to make any further advances in prices except when this office has been given reasonable advance notice and opportunity is had to study the proposed increase on the basis of appropriate data indicating that costs of operation have increased. We should expect this undertaking to relate also to changes in the prices of basic raw materials affecting prices of finished products so far as they are under your control."

Mr. Henderson said O.P.A.C.S. welcomes the creation of the coordinator's office and will give it full cooperation, and he paid high tribute to the oil industry, saying that he has had no more satisfactory experience than with the oil industry when he was a member of the T.N.E.C. The oil industry, he said, has the intelligence to give good cooperation and there should be no cause for complaint. Turning to the subject of prices, Mr. Henderson said that he has known for some weeks that something would have to be done about oil prices but he has been gratified with the response from the industry to requests not to make unwarranted increases. He warned, however, that if his letter to refiners and marketers does not bring results something else will have to be tried.

As to prices generally, Mr. Henderson said that he had been well pleased with the general course of prices until a few months ago, but recently there has been a noticeable tendency to increase prices of all sorts. He warned that inflation does not just happen but is the result of numerous individual price increases, and that the pressure to raise prices would be accentuated by priorities and the pressure of increased purchasing power. Voluntary cooperation in keeping prices in line is the fair, American way, he said, adding that he recognizes changes in competitive conditions and that sometimes increases in prices and in differentials are warranted. All price changes should be based on facts, said Mr. Henderson, and the coordinator's office offers the facilities to secure the facts regarding oil prices.

Meeting Thrown Open to Discussion

The meeting was then opened to remarks from the floor, with Mr. Davies giving assurance that no speakers had been "primed" or "planted."

The first to take the opportunity was A. C. Mattei, president of the Honolulu Oil Corp., who described himself as an independent operator in California. He pledged his full cooperation to the coordinator, and said that people he had talked to at the meeting were appreciative of the fact that Mr. Ickes is depending on the oil industry for assistance and cooperation.

Mr. Mattei apparently gave the cue for others present, if one was needed, for one man after another from many branches of the industry expressed confidence that a cooperative effort will bring results, though some offered suggestions or warned of possible difficulties.

Probably the sentiment of most of those present was expressed by Clarence Beesmeyer, of Gilmore Oil Co., California, who said: "If Secretary Ickes is taking over our business I hope he returns it in as good condition as when taken over, with allowance for ordinary wear and tear. This can be done if we all cooperate."

A warning of the "squeeze" which may be facing the independent jobber was given by Willard Hedden, treasurer of the Hedden Co., Dover, N. J., a small independent jobber. He said that he had been notified by the major company which supplies him that because of the shortage he will not be able to get any more fuel oil, while at the same time the same major company is circularizing owners of oil burners telling them that there is plenty of oil and offering free gift packages of household articles if they will sign contracts with this company.

The applause which followed Mr. Hedden indicated that the conference included a good percentage of jobbers facing the same difficulties. Dr. John W. Frey, of the Petroleum Conservation Division of the Department of the Interior, who was presiding at the time, said this is a problem which may be experienced by others unless there is a full cooperation in the program, and he asked that all jobbers report conditions to the coordinator in detail.

M. B. Whiting, of Clifton Forge, Va., speaking for the South Eastern Jobbers Association, asked that the coordinator prevent "such atrocities" as pictured by Mr. Hedden, and drew a laugh with the warning that the coordinator at the same time should see to it that the jobbers do not put the majors out of business. Paul E. Hadlick, secretary of the National Oil Marketers Association, urged that jobber representatives on committees be bona fide owners of independent businesses not controlled by majors, warning that if not his association would complain loudly; he said the jobbers will cooperate wholeheartedly but that

This Week...

Nominations from organized groups and individuals in the industry for the oil coordinator's regional committees were pouring into Washington this week. Secretary Ickes invited the industry to submit lists of qualified oil men from which could be selected members of four committees in each of the five regions into which the coordinator has divided the country for administrative purposes. Opportunity extended the industry to nominate regional committeemen heightened hopes that it will have a liberal voice in framing policies of coordination. The 20 regional chairmen will compose a national group reporting direct to the coordinator's office.

●

Senator Gillette of Iowa, sponsor of various bills to dismember the industry, introduced a measure in Congress last week that would prohibit officers or directors of any company convicted of antitrust law violation from serving on committees created by the coordinator.

●

The next conference between Deputy Oil Coordinator Davies and representatives of companies planning the large defense pipe lines from Texas to the East Coast was being held June 26.

●

Railroad companies and trade representatives continued their opposition to pipe-line construction in a Senate subcommittee hearing June 23 on the Cole bill. They questioned need for the large interstate lines from a defense standpoint. Claim was made that 20,000 idle tank cars were sufficient to offset diversion of 50 tankers, an assertion previously refuted by oil men. Railroaders were not prepared to say they could meet pipe-line efficiency in making deliveries even under peacetime conditions.

●

Acting Attorney General Biddle gave oil men essentially the same assurance of Department of Justice cooperation with the petroleum coordinator as was extended by Robert H. Jackson before his appointment to the Supreme Court. Recommendations of the coordinator are to be reduced to writing and published in the Federal Register. Chief assurance is that the oil industry will not be asked to do things frowned upon by the attorney general's office.

●

The Illinois Legislature rushed through four laws dealing with physical waste, containing no authority for restricting production.

●

Germany's move against Soviet Russia's Caucasus where oil production averages 435,000 to 450,000 bbl. daily, is regarded by European observers as highly revealing. Reich oil supplies may be sufficient for its military operations but inadequate for general economy of territory under its control. Major Soviet fields on the Caspian are 700 to 1,200 miles from Bucharest, Rumania.

●

A California company proposed this week to tunnel under the ocean at Long Beach, excavate chambers large enough to accommodate a drilling rig and develop submerged portions of the Wilmington field beyond reach of directionally-drilled holes.

●

Domestic production hit a new peak for the year last week averaging 3,864,145 bbl. daily.

●

Accumulative domestic crude-oil production for the year climbed last week above the 600,000,000-bbl. mark. Output is roughly 17,000,000 bbl. behind the comparable 1940 figure.

●

Refiners are engaged in and planning what may prove a record year in expenditures without adding materially to capacity. Funds are going into synthetic rubber, toluene, alkylation and other specialty plants at a record rate.

●

East Coast crude-oil stocks totaled 11,872,000 bbl. on June 14, a 21-day reserve at the recent rate of refinery operations. During that week crude inventories fell 187,000 bbl., accounting for 38 per cent of the nation's total reduction.

●

Plans for elimination of cross hauls as a means of relieving the petroleum transportation situation automatically raise the question of standardized grades of products.

any relaxation of the antitrust laws must be proved to be required by national defense. Another jobber who spoke was Wallace Wright, president of the Illinois Jobbers Association, who said he believes in the petroleum family and that the program will be a success if all cards are played face up.

Retailers Raise Question

Among the retailers who spoke were M. E. Holland, president of the National Association of Petroleum Retailers, who offered the complete cooperation of his group; Sol A. Herzog, counsel for the Retail Gasoline Council of New York City, who asked a full disclosure of the necessities of today in order that retailers may have a complete understanding of their position; Louis Kimmel, Brooklyn retailer, who asked more representation for retailers than on the N.R.A. code; and John W. Scott of the New England Oil Men's Association, who asked that steps be taken immediately to inform consumers as to what the supply situation will be for various products.

On behalf of producers, Warwick M. Downing, of Denver, Colo., a member of the Interstate Oil Compact Commission, made a plea for continuing development, and asked that the Interior Department open up public lands to oil drilling. He said that a fair price for crude is a necessary attribute of conservation, since there will be little exploration if the price is too low but it is necessary to locate 28,000,000,000 bbl. during the next 20 years. W. A. Delaney, Jr., of Ada, Okla., who described himself as an independent wildcat producer, asked aid in getting steel for new drilling and suggested that the Government make a factual survey of reserves and demand and keep the price of crude from declining in order to maintain exploration. H. P. Taubman, of Dallas, Tex., declared that the present price of crude is inadequate to maintain stripper-well production, and asked that the price be increased to $1.50 per barrel in the interest of national defense. On the other hand, Joe Hill, of East Texas, said that the East Texas field alone could furnish all the oil needed for national defense if transportation facilities are provided and production restrictions lifted.

Others who spoke included Benjamin Botwinick of the Taxicab Owners Association of New York City, who declared that much gasoline could be saved if municipal authorities could be induced to change taxi regulations and who promised to submit a detailed program for this; R. M. Sherman, of the Oil Burner Institute, New York, who declared that voluntary conservation is the American way as opposed to totalitarian rationing and that efficient use of oil burners would save the facilities of 10 tankers; N. R. Skaggs, of the New York Oil Heating Association, who said that householders could not be expected to convert their furnaces to coal and that a ceiling should be imposed on the price of fuel oil; A. V. Simonson, of the Gaso Pump & Manufacturing Co., who asked aid in obtaining priorities for oil equipment.

The meeting was brought to a close by William S. Farish, president of the Standard Oil Co. (New Jersey), who said that he had assumed it was not necessary to have a show of hands on the question of industry cooperation with the Government. On behalf of his company and the other major companies who have been working with Secretary Ickes and Mr. Davies for some time he pledged the utmost help and support.

●

Bill Would Bar Services of Antitrust Act Offenders

WASHINGTON, D. C., June 24.—A minor bombshell was thrown into the plans for setting up the petroleum coordinator's office and industry advisory committees by a bill introduced in Congress, on the same day as the conference, which would prohibit the Government from obtaining the services of any man whose company had violated the antitrust laws.

Introduced by Sen. Guy M. Gillette of Iowa and Rep. Robert F. Jones of Ohio, the bill is in general terms and would apply to all agencies of the federal Government, but statements issued by the joint authors made it plain that it is aimed at Deputy Coordinator Davies and the oil industry. It is not likely that the bill will be enacted or even receive serious consideration by Congress, but the fact that it is pending constitutes a threat to plans for industry cooperation and in effect imposes additional penalties for antitrust law violation by prohibiting an officer of a convicted corporation from serving the Government or even offering it any advice.

Soviet Oil Coveted by Hitler In Nazis' Latest Drive

By J. P. O'DONNELL

NEW YORK, June 24.—Nazi Germany has not clearly defined her intentions in the invasion of Russia but there is no question that they embrace the acquisition of the Ukraine and the Caucasus, the former for its grain and the latter for its oil.

If Germany wins there will be little question that the Nazis will be amply supplied with oil for a war of long duration. The Caucasian oil fields produce more than 85 per cent of all Soviet production, estimated to be in the neighborhood of 220,000,000 bbl. annually and with a greater potential.

Germany is credited with being able to produce enough oil, crude and synthetic combined, to meet all her military requirements but there is a shortage of oil in Nazified Europe. Without sufficient oil, Germany is unable to take full advantage of the productive facilities now under her control and these facilities become increasingly important as the war lengthens. Two sources adequate to meet in whole or in part the European deficiency are open to the Reich, the Caucasian fields or those of Iraq and the Persian Gulf region.

Russian fields have a far more important characteristic so far as Germany is concerned than West Asian fields. This is their accessibility.

Three Main Areas

The principal Caucasian oil fields are grouped in three areas: Azerbaidjan, Grozny and Maikop. The Azerbaidjan fields are in southeastern Caucasus, extending westward from the Aspheron Peninsula almost half way across the isthmus. These fields produce approximately 165,000,000 bbl. of crude oil annually, about 75 per cent of all Soviet production. There are more than 8,000 wells in the numerous fields that dot this area. Production is transported through two pipe lines, each about 600 miles long, which extend from Baku on the southern shore of the Aspheron Peninsula on the Caspian to the port of Batum on the Black Sea, just north of the Russo-Turkish border.

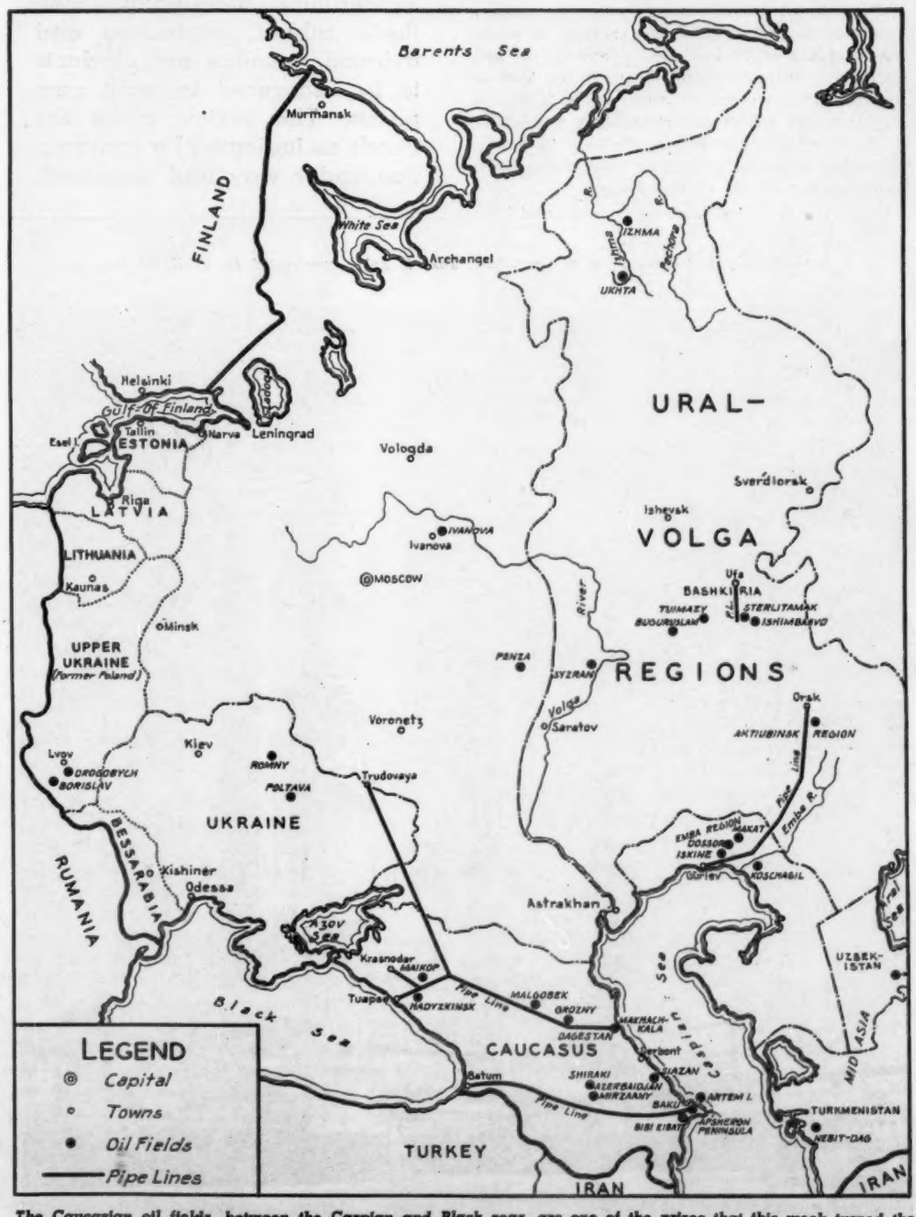
The Grozny fields in Circasia are Russia's second most important and at their peak in 1932 produced about 65,000,000 bbl. annually. Production has steadily declined since then and is now approximately one-third of its peak. Crude oil from the Grozny area is low in gasoline content but is paraffinic in composition and a good base for lubricating oils. Grozny fields are served by pipe lines originating at Makhach Kala on the shores of the Caspian and extending west to Taupse on the Black Sea. A branch of the line to Taupse breaks off east of Maikop and carries oil to Trudovaya on the northern border of the Ukraine.

Russia's third most important fields are those comprising the Maikop group where oil has been produced in some volume for well over 100 years. Production in this district increased steadily over the past 15 or 20 years and in 1938, the last year for which reliable statistics are available, output was close to 15,000,000 bbl. Reserves in this area, situated in the Kuban province north of the Caucasus Mountains, are estimated at well over 500,000,000 bbl. An 8-in. pipe line connects this region with the 22,000-bbl. per day refinery at Krasnodar and it is also connected with the Grozny-Taupse line to the Black Sea.

The only other Russian fields of importance are in the Ural-Volga area. Production there has increased sufficiently to warrant building a new pipe line to the Ufa refinery, 40 miles north of the fields. Other production is to be found in the Emba region on the northern shores of the Caspian Sea but the combined production of these two areas is not much more than 10 per cent of the total.

The Grozny and Azerbaidjan (Baku) oil fields are 1,000 to 1,200 air miles from Bucharest, Rumania, one of the largest bases now in the hands of Germany. Shipping ports and pipe-line terminals on the Black Sea at Taupse and the Maikop fields and refineries are 650 to 700 miles from Bucharest. If German invasion operations are

(Continued on Page 27)



The Caucasian oil fields, between the Caspian and Black seas, are one of the prizes that this week turned the Nazi blitzkreig crashing across the border dividing Axis and Soviet territory

Refiners Map Huge Expansion Program Minus Capacity Gain

By H. STANLEY NORMAN

Specialty and chemical-recovery plants for the production of defense materials in conjunction with petroleum-refining operations promise to make this year one of the largest in the recent history of the industry from an expenditure standpoint. Synthetic rubber, explosives and aviation gasoline are products to be recovered in most new plants. This review treats the trends as indicated by construction under way and proposed.

EXPENDITURES involved in construction started, contracted, and proposed this year by the refining branch of the oil industry and related manufacturers may exceed those of any similar previous period. Potentialities of the situation may conceivably cause expenditure of a quarter billion dollars or more if contingencies now visualized are culminated by world events.

The petroleum-refiners' program has been enlarged since June 1 by announcement of plants and proposed expansion of facilities costing about $25,000,000.

Prospective high expenditures for the refining industry this year involves the anomaly of resulting in only a slight increase in capacity for producing the ordinary petroleum products. Most of the current and proposed construction is for the production of special materials which are related to gasoline, fuel, and motor oils only in the respect that they are all derived from the common source of petroleum hydrocarbons.

Standard Oil Co. of Louisiana's butyl and buna rubber plant at Baton Rouge, La., is the largest single new project announced so far this year. Between $12,000,000 and $15,000,000 will be spent by the company in construction of this new synthetic-rubber plant, design for which contemplates production of 15,000 tons annually. Included in the total new-plant capacity will be 5,000 tons of butyl rubber which will be produced on a commercial scale for the first time in the United States when the project is placed in operation. The company has received a satisfactory priority rating and the State of Louisiana has approved a 10-year property-tax exemption.

Process for commercial production of butyl rubber which, W. S. Farish, president of Standard Oil Co. (New Jersey), recently told stockholders had many advantages over natural rubber, was evolved by chemists of the Standard of Louisiana organization and affiliates.

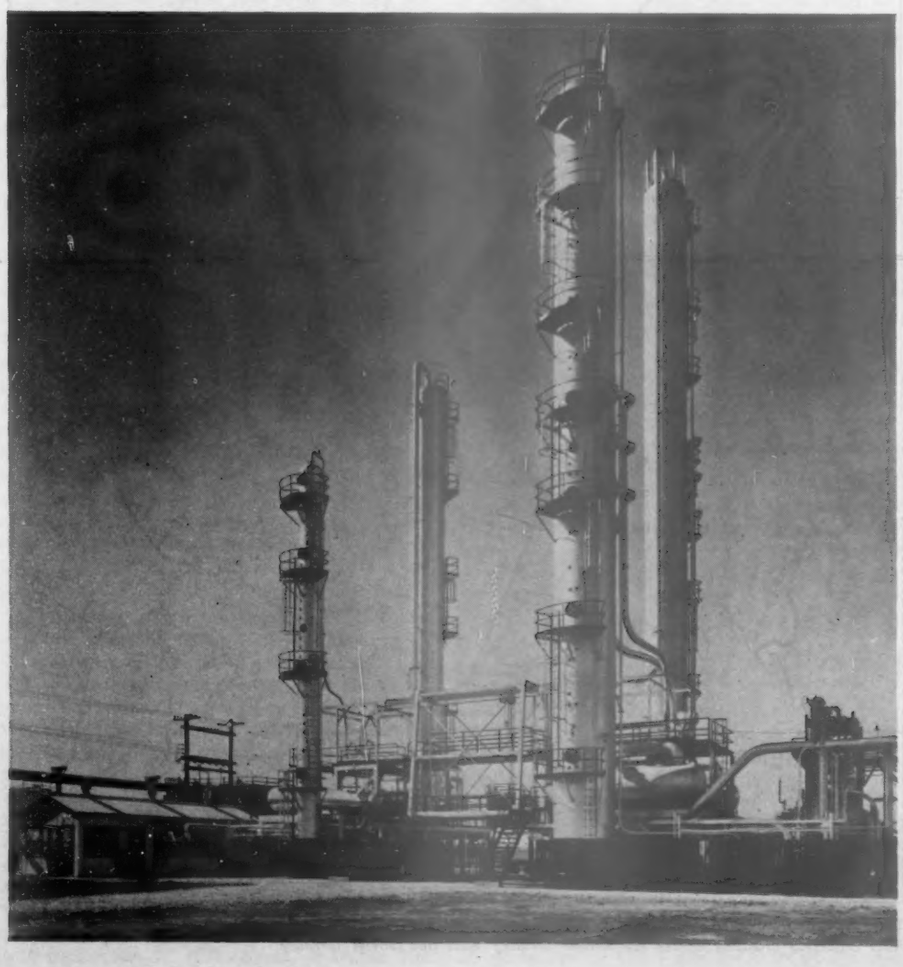
A smaller plant costing $3,000,000 and capable of producing 2,000 tons of buna rubber annually, was placed in operation recently by Standard of Louisiana at Baton Rouge.

Enormity of the call that may be made eventually on the petroleum-refining industry to supply United States rubber requirements almost defies imagination. The United States consumes about 800,000 tons of rubber annually and imports exceed 700,000 tons.

Total current production of synthetic rubber, including processes stemming from ethylene and broadly classified as "vinyls," is less than 24,000 tons annually. Expansion of all types of synthetic-rubber plants planned for completion or for a start on construction this year will increase the domestic producing capacity to almost 100,000 tons.

If the cost of plant facilities to produce 15,000 tons of rubber is representative, the petroleum industry may be eventually called upon to spend $250,000,000 to $500,000,000 to supply rubber now imported. Procurement of rubber abroad is largely dependent on freedom of trade in the Pacific with the Netherlands East Indies.

A duplicate of this toluene plant at Deer Park, Tex., is being constructed by Shell Oil Co., Inc.



Moderate Expansion Indicated

The petroleum industry has so far and will continue to exercise caution in expenditures for synthetic-rubber producing facilities. There are so many contingencies which will determine the demand for rubber synthesized from petroleum hydrocarbons that any other approach to utilization of this potential source of supply would be of questionable economic judgment. Economies not now present in synthetic-rubber production would result from mass output but natural rubber has superior qualities for certain types of service that would be difficult to offset without inducements of an emergency.

Petroleum refiners are prepared and willing to make expenditures necessary to produce any required volume of synthetic rubber. Still, there is no inclination on the part of the industry to expand facilities beyond limitations of sound economy.

Refinery construction and erection of facilities to produce special products from petroleum hydrocarbons proposed in the near future and nearing

completion breaks down into broad general classifications under the general program of manufacturing of defense materials.

One group includes rubber-manufacturing operations and toluene plants. Another group is more intimately related to the chemical industry. A third covers facilities for producing 100-octane aviation gasoline, and the manufacture of ingredients for tailored fight-grade fuels.

Most immediate attention is focused on production of 100-octane aviation gasoline, processes for which have been developed to where they are now mostly a matter of selecting the operation best suited to the raw material available. Desire of government officials to expand potential supplies of 100-octane gasoline was emphasized recently by recommendation of Dr. Robert E. Wilson, consultant, petroleum unit, Office of Production Management and the Joint Aeronautical Board of the Army and Navy. Request was made through Dr. Wilson's office that the petroleum-refining industry expand its facilities for producing 100-octane aviation gasoline by 25 per cent. Acquiescence by the industry would expand 100-octane capacity to 50,000 bbl. daily. Less than a year ago, the industry was qualified to produce only about 30,000 daily and now capacity is 37,500 bbl. daily. Request of the O.P.M. was made in anticipation of growing demand which, according to estimates, will exceed current producing capacity within the next 12 to 18 months.

Expansion For Future Asked

Expansion was asked by Dr. Wilson despite inability of any responsible government agency to assure a market for the added production of 12,500 bbl., if the industry acts on the request. Estimates on the cost of expanding aviation-gasoline producing capacity to the extent requested by Dr. Wilson place the figure at about $10,000,000. There appears to be less risk attached to the new request for expansion of aviation-gasoline producing capacity against probable demand than in the earlier stages of the defense program.

Plants for production of chemicals wholly or partly dependent on the defense program for their output are an important phase of current construction. Humble Oil & Refining Co. will complete next October, or earlier, the largest toluene-manufacturing facilities in the country at Baytown, Tex. The toluene plant, which will produce this basic ingredient of explosives, is being constructed at a cost of $10,760,000. Additions to previous refinery equipment at Baytown for recovery of toluene-plant charging stock and for operating power will cost $1,100,000. It is estimated that Humble will be able to produce more than 10,000,000 gal. of toluene annually from which about 100,000,000 lb. of TNT can be manufactured. The Baytown toluene plant is to be owned by the Government but will be operated by Humble on a cost-plus-fixed-fee basis.

At the Deer Park refinery of Shell Oil Co., Inc., a companion unit of the first toluene plant to start operation in this country is now under construction. The first unit was placed in operation in December 1940. The Shell plant at Deer Park will have capacity later this year for production of 4,000,000 gal. of toluene annually from the two units. Raw materials available at the Shell plant are sufficient to manufacture 10,000,000 gal. of toluene annually and other refineries of the company in the United States could prduce 40,000,000 gal. of toluene a year, if called upon for this service.

Just completed and starting operations is Carbide & Carbon Chemical Corp. plant at Texas City, Tex., 25 miles south of Houston. The plant, built at a cost of approximately $4,000,000, operates on still gases developed in the Pan American Petroleum & Transport Co. refinery on an adjoining site. Only meager information has been made available on the Carbide & Carbon Chemical plant at Texas City because its products will have a definite relationship to certain phases of the defense program. One of the materials Carbide & Carbon Chemical is expected to produce is butadiene which is about 75 per cent of the buna rubbers manufactured from petroleum gases.

Phillips Petroleum Co. and Shell Oil Co., Inc., are other manufacturers of raw materials from which synthetic rubber is being produced on commercial scale.

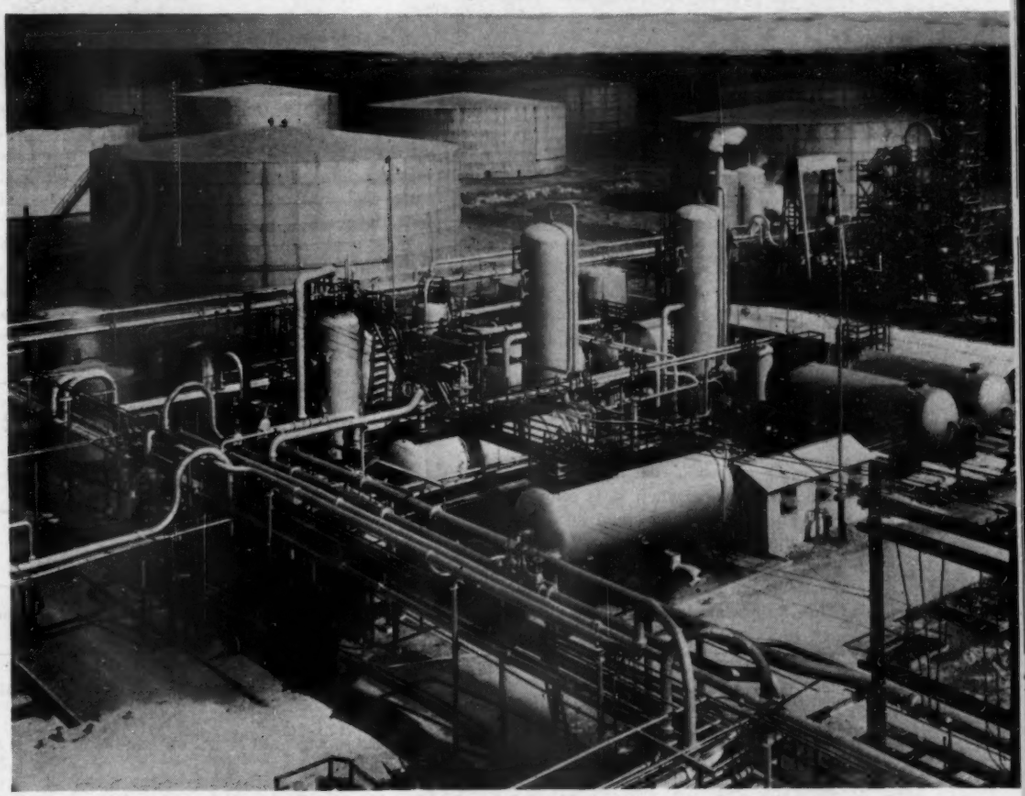
Second Unit Near Completion

Shell has completed about 50 per cent of the construction on another plant at Deer Park Tex., for recovery of butadiene. Expenditure for this plant, under original plans, was estimated at $2,200,000 but expansions and additions authorized during progress of construction are estimated to raise the total to $4,000,000. The plant will have capacity for producing 5,000 tons of rubber annually.

Conversion of stabilizer gases into ethyl chloride, a process already in use for 3 years at Ethyl Gasoline Corp. Baton Rouge, La., plant, is to be applied on an increasing scale. The company is building a new plant at Baton Rouge that will use an improved, yet similar process to that employed in the older unit. Stabilizer gas with a molecular structure of three to four carbon atoms is cracked at temperatures above 1,400° F. Gas recovered in the cracking operation is condensed at temperatures starting at 140° F. below zero. Ethylene gas recovered in the process is treated with acid to form ethyl chloride. Consequently, the petroleum industry now supplies a large portion of the prime intermediate for the manufacture of antiknock compounds used in blends for aviation fuel and other premium grades of gasoline.

Construction of facilities for production of the more common petroleum products is largely directed now to installation of more recently developed cracking processes. Two large units for commercial application of the new fluid-catalyst cracking process are scheduled for construction this year, although difficulties of obtaining steel attendant to the defense program may prevent completion of more than one.

Argument is advanced that approximately 30 per cent of the petroleum industry's refining capacity is less than 4 years old, in concentrating steel deliveries for refinery projects that have a direct relation to production of defense materials. Still, refiners have encountered no insurmountable difficulty in qualifying for priority consideration if steel is necessary for maintenance work or even expansion when a legitimate demand can be sustained.



Alkylation plant at Humble Oil & Refining Co.'s refinery at Baytown, Tex. The alkylate produced here goes into 100-octane gasoline. Expansion of alkylation capacity is on this year's construction program

All Petroleum Exports Placed Under License

WASHINGTON, D. C., June 23.—All petroleum products have been placed under export control by order of President Roosevelt, but the Department of State issued general licenses so that the new restriction applies only to exports from Atlantic Coast ports to destinations other than the Western Hemisphere, Egypt, and British Empire.

The new order does not affect aviation gasoline and other petroleum products previously subject to export license control except that none of these can henceforth be exported from Atlantic ports except to the same list of countries.

The president's order gives the Government a complete check on all exports of petroleum products. The action was taken, it was explained, solely because of the transportation shortage on the East Coast, and not for diplomatic reasons. It therefore does not affect Japanese purchases of petroleum except at Atlantic ports.

Development of New Fields Boosts Illinois Production

By HARRY F. SIMONS

CENTRALIA, Ill. — Illinois, an unpredictable factor in the oil industry for the past 4 years, is again proving that forecasts made about it are subject to change on short notice. Six months ago most of the operators were inclined to agree that the state had passed its productive peak and would probably decline steadily for the next 5 years.

From January until the latter part of May 1941 it appeared the state was hard put to maintain a production between 320,000 and 330,000 bbl. daily. In only 4 weeks, May 17 to June 14, the total output from the state has jumped from 322,000 to 342,000 bbl. daily. And the prospects are favorable for a continued increase through the next 5 months with a distinct possibility the state's production will pass 360,000 bbl. daily.

The state has no marketing problem to speak of up to 400,000 bbl. daily and at one time it produced and disposed of over 500,000 bbl. daily. The daily production in Illinois is almost a complete gage of the ability of the area to produce; the exceptions are a pair of fields in which the bulk of the withdrawal is regulated.

Work Widely Distributed

The increase in production in the total output has added significance when it is seen that the state's principal field, Salem, had declined 22,000 bbl. daily since the first of the year. This decline has been due to the falling off of production from the Devonian and upper zones and the failure to find large-scale production in the Trenton lime. Centralia has declined 3,000 bbl. per day and Louden has dropped 5,000 bbl. daily. Roughly, this means that 41,000 bbl. daily of new oil has been found in the state since January 4, when the state's output was 326,000 bbl. daily.

The ability to maintain and increase the production in Illinois has been due to a continuous wildcatting campaign, to the numerous extensions to already known fields and to the rapid drilling of fields once they are discovered. The results of the wildcatting campaign are shown in the accompanying discovery table and graph, Fig. 3. Since the first of the year, there have been 20 new fields and 16 extensions to existing fields.

It is interesting to note that the drilling activity in the state has increased substantially from 329 during the last week in March to 404 at the present time. As compared to a year ago, drilling in the state has declined as there were over 500 cable-tool and rotary rigs running during the week of June 15, 1940. However, at that time there were 141 active operations at Salem, 80 at Centralia and 50 at Louden. During the first week of June 1941, there was no new drilling at Salem, two active operations at Centralia and 19 at Louden. Outside of these three fields, activity in the state has actually increased by 150 active operations.

Year's Important Discoveries

There have been some important discoveries since the first of the year. Principal ones are the Benton field, where big Tar Springs production was uncovered and the proof that the Louden Devonian was productive. In addition, the development of Tar Springs production near Sailor Springs and other similar discoveries have opened wider vistas to the Illinois prospector.

The worth of the Louden Devonian has not definitely been proven as yet. It may be an extreme-

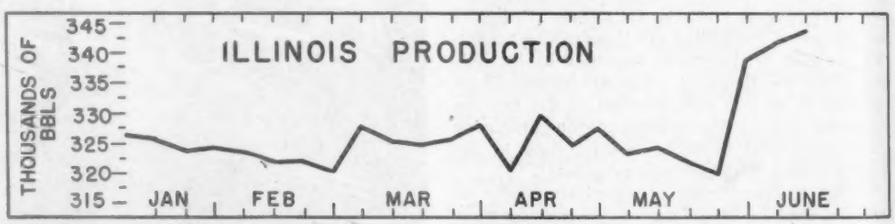
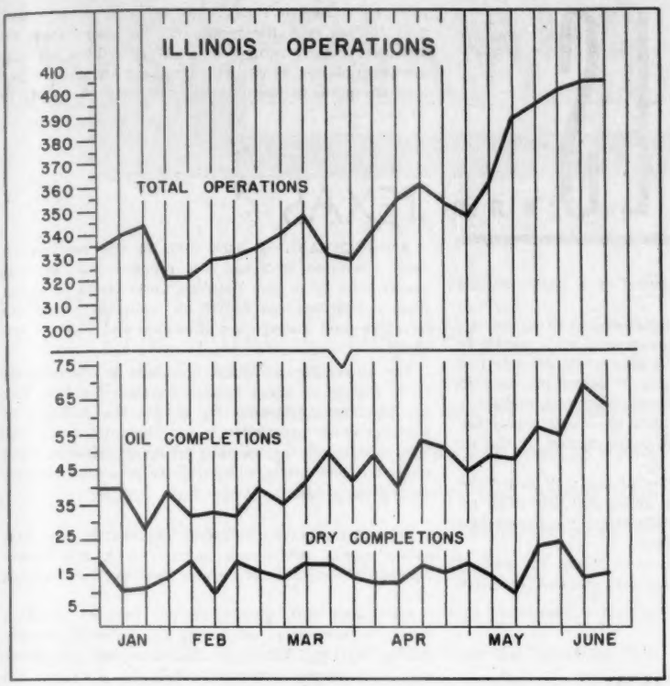


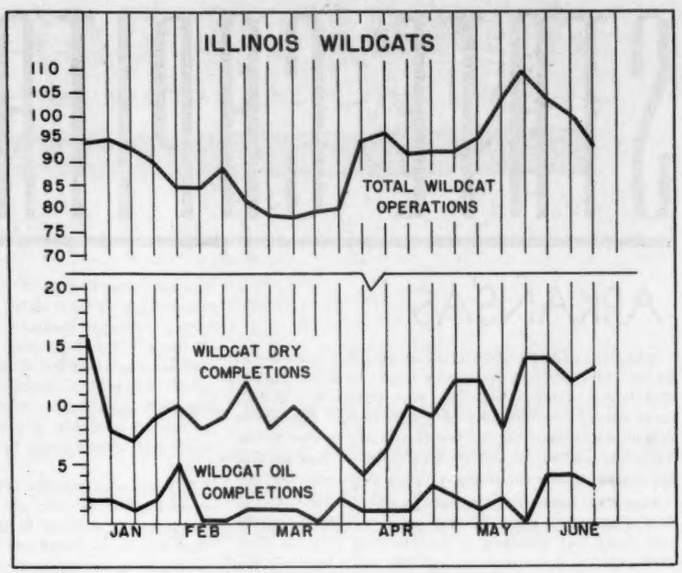
Fig. 1—Illinois production history since January shows a sharp increase for the last 4 weeks

ILLINOIS DISCOVERIES, JANUARY 1 TO JUNE 3, 1941

Pool and county	Well	Location	Production (bbl.), and sand	Depth (ft.)	Date completed
Allendale, Wabash	Joe Young 6 Stilwell	600 ft. NL, 1,520 ft. EL, SE 1-1n-12w	P 250, Benoist	2,011-21	1-7-41
*Dubois, Washington	Renwaldt 1 J. Bander	NW NW NW 20-3s-1w	P 48, Bethel	1,372	1-7-41
Dahlgren, Hamilton	Dick Duncan 1 Zella	SE NE NE 34-3s-5e	P 132, McClosky	3,337-59	1-14-41
*South Barnhill, Wayne	Lain Oil & Gas 1 Felix	E½ SE NE 9-3s-8e	P 160 oil and 45 water, McClosky	3,434-40	1-14-41
Benton, Franklin	E. S. Adkins 1 Orient Coal Co.	NE SW SE 24-6s-2e	F 397, Tar Springs sand	2,112-48	1-21-41
South New Harmony, White	F. H. Rhodes 1 Golden	SW SE NE 29-5s-14w	P 112, Waltersburg sand	2,254-82	1-28-41
East Patoka, Marion	Obering & Phillips 1 Thompson	NW NW NW 35-4n-1e	P 84, Weiler	1,349-59	1-28-41
South Herald, White	Mabee 1 Knight	SW SW SE 10-7s-9e	P 120, Tar Springs sand	2,254-66	2-4-41
*Omaha, Gallatin	Cameron Bros. 1 Green	NW SE SW 4-9s-8e	P 42, Palestine sand	1,702-18	2-4-41
*New Harmony, White	Bell Bros. 1 Morris	NW SW NW 21-5s-14w	P 116, Waltersburg sand	2,349-69	2-4-41
Bone Gap, Edwards	Tide Water 1 Gawthrop	NE NE NE 13-1s-10e	P 46 oil and 85 water, McClosky	3,266-78	2-4-41
*Salem-Trenton, Marion	Paul Rossi 8 Brooks	330 ft. SL, 282 ft. WL, NE SW 29-2n-2e	P 130, Trenton	4,618	2-4-41
West Frankfort, Franklin	E. S. Adkins 1-B Orient Coal Co.	SE NE NW 12-7s-2e	P 31 oil and 66 water, Tar Springs	2,054-68	2-25-41
Springerton, Hamilton	Woodriver Dev. Co. 1 Walker	SW NE NW 26-4s-7e	P 41, 20 per cent water, Aux Vases	3,275-90	3-4-41
East Boyleston, Wayne	Watkins 1 Reffler	N½ SE SE 35-1s-7e	P 128, McClosky	3,316-35	3-11-41
*Roland pool, White	Kingwood & Exchange 1 Porter	NE SW SW 12-7s-8e	P 36, Weiler	2,572-82	3-25-41
New Haven, White	Hiawatha 1 Stenson (formerly Benedum-Trees)	SW SW NE 19-7s-11e	P 107, Tar Springs	2,118-29	3-25-41
Posey pool, Clinton	J. F. Ashoff 1 Lampon	315 ft. NL, 160 ft. WL, NW NW NW 16-1n-2w	P 29 oil and 1 water, Weiler	1,101-10	4-1-41
Maunie pool, White	Ralph Halbert 1-A Hubele	330 ft. NL, 1,050 ft. WL, SW 7-6s-11e	P 20, Palestine sand	2,012-18	4-8-41
*Calvin, White	W. W. Gray 7-H, fee "D"	810 ft. SL, 150 ft. EL, NW SW 21-4s-14w	F 300, Aux Vases sand	2,818-50	4-15-41
*Iola, Clay	A. R. Madden 1 Ging	195 ft. SL, 250 ft. EL, SE SE 17-5n-5e	P 100, Aux Vases	2,377-92	4-22-41
*Mill Shoals, White	Texas 8 Poorman	SE SE NW 32-3s-8e	P 37 oil and 149 water, McClosky	3,390-96	4-22-41
*Benton, Franklin	W. O. Morgan 1 J. P. Minier	NW NW NE 36-6s-2e	F 912, Tar Springs	2,116-63	4-22-41
*Dale, Hamilton	Cameron Bros. 1 Kern	NE SE SW 7-6s-7e	P 50, Bethel	2,905-31	4-29-41
Lakewood, Shelby	W. H. Sloan 1 Cutler	150 ft. SL, 150 ft. EL, SE NE 12-10n-2e	P 37, Aux Vases	1,723-35	4-29-41
*North Boos, Jasper	Lain O. & G. 1 Henry "A"	SW NW NW 9-6n-10e	F 273, McClosky	2,794-2,826	5-6-41
Rising Sun, White	Cherry & Kidd 1 Karch	SW NW NE 24-6s-10e	P 158, Aux Vases	2,840-65	5-13-41
Ellery, Edwards	Bruce Martin 1 Lester	W½ SW SW 19-2s-10e	P 127 fluid (60% b.s.&w.), McClosky	3,340-48	5-13-41
Bompas, Richland	Paul Osborn 1 Bowers	SW SW SE 34-3n-14w	P 240 oil and 50 water, McClosky	3,118-29	5-27-41
West Francisville, Lawrence	C. E. Everts 1 Catt	SW SE SW 23-2n-12w	P 25, sand	1,379-97	
South Dix, Jefferson	Clark Nye 1 Sargent	SW SW NW 22-1s-2e	P 63 in 23 hours, Bethel	1,931-36	5-27-41
*Louden Devonian, Fayette	Whisenant & Trenchard 25-D Lilly	C E½ NW SE 16-8n-3e	Est. 2,000 daily, Devonian	3,063-3,130	5-27-41
Sailor Springs, Clay	Carl Robinson et al 1 Tolliver	SW NW SE 26-4n-7e	P 254 plus 6% salt wtr., Tar Springs	2,327-41	6-3-41
*Irvington, Washington	Kingwood 5 Brink	SE NE NE 15-1s-1w	P est. 144, Bethel	1,511-26	6-3-41
*Rising Sun, White	Cherry & Kidd 1 Prell	NE SE SW 24-6s-10e	P 147, Tar Springs	2,237-30	6-3-41
*Roland, White	Fisher Oil and Arrow Drilling 1 Ellis	NE SW SE 11-7s-8e	F 308, Waltersburg sand	2,146-67	6-3-41
....., White	Hal Compton 1 Grey	NE SW SW 21-4s-14w	F 800, Aux Vases	2,862	6-10-41
....., White	Continental 1 Ackermann	NE NW NE 25-5s-10e	P 20, McClosky	3,097	6-10-41
*Mason, Effingham	Lynch & Jansen 1 Burk	SW SE NW 27-6n-5e	P 175 oil and 5 water, Bethel	2,302	6-10-41

*Extension or new pay in existing pool.





Left: Fig. 2 shows the recent history of Illinois activity; in 10 of the last 12 weeks there has been an increase in the number of operations. Above: Fig. 3 shows what has been happening as a result of the wildcatting campaign. Except for February and March the number of active outposts has been fairly steady

ly prolific field, as good as Salem or the north end of Centralia, or it may be something of a flop from a production standpoint with the wells barely paying a profit. The better part of the structure has not been tested yet and there have not been enough wells drilled to present a complete picture. If the Devonian at Louden is as good as many expect it to be, it will contribute substantially to the state's output.

More pieces are being fitted into the picture of the southern and southeastern part of the basin. It has been necessary for the oil companies to revise their ideas concerning this area. Recent developments have shown that there is no sure way of determining the oil possibilities of a particular locality without adequate drilling, that good production may be found in zones which have not previously been outstanding for their possibilities and that numerous small fields exist which will be difficult to find.

How much longer Illinois can continue to discover new oil in substantial quantities is a question. During the first 5 months of 1941 there were nine more fields discovered than there were during the first 6 months of 1940. Most Illinois observers agree that development can continue at the present rate for 3 to 5 years before the possibilities will be exhausted to the point where it will become economically unfeasible for prospecting on a wide scale.

Recent price changes have heartened the Illinois producers and in view of the larger reward they are willing to spend more money in the effort to find new oil. However, the Illinois price has reached a point where further advances might possibly eliminate some of the state's market. At the present time, Oklahoma and Kansas oil can be delivered at Chicago at 1½ cents less total cost than Illinois oil. Illinois oil being shipped to the St. Louis area enjoys a 2½-cent price advantage. For delivery eastward, Illinois oil continues to hold a very substantial advantage.

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Soviet Oil Coveted by Hitler In Nazis' Latest Drive

(Continued from Page 23)

conducted from Constanta, the Rumanian port on the western shore of the Black Sea, the distances to Soviet oil centers could be reduced about 100 miles.

The northern branch of the Grozny pipe-line system extends to Trudovaya, which is about 900 miles by air from Warsaw, the nearest German invasion post in what was formerly Poland. Kiev, the Ukraine industrial center which was among the Soviet cities bombed in the first days of Germany's attack, is 450 miles from Warsaw and about 100 miles west of the most northern pipeline terminal.

Soviet oil fields on the north end of the Caspian Sea and others in the Ural-Volga region are about 1,700 miles from Warsaw.

Considerable Soviet petroleum might be transported up the Volga River, a method now used to serve part of western and northern Russia, and finally into middle and western Europe by canals, railroads and other inland waterways.

Most Soviet refining capacity is also located in the Caucasus. Approximately 600,000 bbl. of her total capacity of around 650,000 bbl. daily is in this region. The accessibility of these refineries as well as the oil fields via pipe line to the Black Sea and thence by tanker to eastern Europe is regarded as the factor which makes them more desirable to Hitler than the fields and refineries of Iraq, Iran, Saudi Arabia and Bahrein.

Besides the pipe lines connecting Baku with Batum, a railroad runs between these two oil ports which could augment the pipe line in laying down large quantities of oil at Batum. A fleet of 35 tankers, most of which are in Black Sea service, would make it possible to deliver this oil to German allies in the Balkans. Russia's tanker fleet would be supplemented by a substantial barge capacity and also by tankers tied up at Constanta when the British closed the Mediterranean. Another route that was opened last year is the inland waterway which connects Kherson on the Black Sea with Brest-Litovsk in former Poland. This route could probably be used to transport substantial quantities of oil to Germany's back door, far removed from the danger of R.A.F. bombing.

In spite of the substantial reserves which exist within her borders Russia has not been able to develop a substantial exportable surplus. When shipments to Germany were inaugurated last fall it necessitated rationing in Russia itself. These exports were reported to be at the rate of only 7,000,000 bbl. annually. There is little question that efficient and systematic German supervision would increase crude-oil production, reduce losses which are reported to be costing an important part of Russian output and improve both the volume and quality of Soviet refinery production.

Germany's need for additional oil was cited last week in study issued by the Foreign Policy Association in Washington. After reporting that Germany's present needs are met by present production it stated: "It is not an immediate need therefore which may have dictated the recent German drive toward Iraq and Iran but the desire to secure adequate supplies for the new German empire in Europe." The study was made by Louis E. Frechtling for the association, a private research organization. Germany is apparently drawing heavily on every continental European source, particularly Rumania, Europe's principal oil-producing country west of Russia, where rationing of petroleum products was begun last week despite the country's normal surplus.

While tension heightened in Europe, the situation between Japan and the Netherlands East Indies apparently was eased considerably despite the denial of the demands of oil-hungry Japan. The indications that relations between Batavia and Tokyo were less strained were contained in the report that the Netherlands East Indies had granted Japan an oil concession for exploration but not necessarily exploitation in Borneo. The concession is reported to embrace an area of nearly 700,000 acres, a considerable extension of the existing Japanese concession in that area where a wildcat of the Japanese controlled East Borneo Oil Co. is said to have discovered an oil-producing horizon recently.

STATE CAPITALS...

ARKANSAS

ALLOWABLE PRODUCTION in July has been set at 73,382 bbl. daily in a new order issued by the Arkansas Regulatory Commission. The new figure is 230 bbl. daily below the June allowable. The decline represents reductions ordered for the Dorcheat and Buckner fields. The July allowable will be continued in August and September unless conditions require other adjustments.

Prorated fields in Arkansas were assigned 49,182 bbl. of the daily allowable and the remainder of 24,200 bbl. daily was assigned to nonprorated districts. The McKamie field allowable of 400 bbl. daily was left unchanged.

Market demand for Arkansas crude in July was estimated by the Bureau of Mines last week at 77,000 bbl. daily.

LOUISIANA

SIGNATURE OF GOV. SAM JONES was affixed to the interstate oil compact Monday, making Louisiana the eighth state to ratify the new agreement between producing states which would extend through September 1, 1943. The agreement previously had been signed by the governors of Oklahoma, Texas, Kansas, Colorado, New Mexico, Illinois, Michigan, and Arkansas.

ILLINOIS

HOUSE ACTION is due this week on compromise oil-conservation legislation which was passed June 20 by the senate 49 to 0. The series of four bills placing control of the Illinois oil and gas industry in the state Department of Mines and Minerals are shorn of principal features embodied in a discarded antiphysical-waste measure.

The bills create a new division of oil and gas conservation in the state Department of Mines and Minerals headed by Robert M. Medill, director, and call for an initial appropriation of $150,000 to administer the acts, together with payment of a $6,000 annual salary to a division chief.

The principal measure strengthens existing powers of the Mines and Minerals Department with respect to drilling and plugging of wells to prevent seepage and waste, issuance of permits, use of safety practices in the field, identification of ownership of wells and other petroleum facilities, and redress in circuit courts following an appeal from hearings conducted by the division.

The bill also permits drilling of one well in a limestone pool or horizon per 20 acres, and sets forth restrictions for drilling in certain tracts measuring less than 660 ft. in width or length.

The new measures, if approved before the end of the current session, June 30, will become effective July 1.

CALIFORNIA

THE CONSERVATION COMMITTEE of California Oil Producers, official curtailment body, held its regular meeting June 26. The meeting was set late in the month in order to permit California representatives to attend the national meeting with Coordinator Ickes in Washington the preceding week.

This month's meeting held more than usual interest because during the previous week Standard Oil Co. of California and Sun Oil Co. abandoned their trading agreement because of a request from Secretary Ickes to suspend all intercoastal shipments of gasoline from California. Producers were interested in stoppage of intercoastal shipments because of any possible adverse affect on demand.

MICHIGAN

GOV. MURRAY D. VAN WAGONER'S signature has made into law amendments to the unitization and severance tax bills. The unitization act enabled majority owners of royalty, by going into Chancery Court, to determine right to lease or develop for oil and gas. The severance tax amendment provides for return of 20 per cent of the 2 per cent tax on oil and gas production to road funds of counties of origin. The 20 per cent for roads will be taken from the amount formerly returning to the townships, reducing township shares to 20 per cent. The amendment permits the state to keep its 40 per cent, the county its 20 per cent.

TEXAS

AN INCREASE of 3,905 bbl. in the net average daily allowable in Texas was reported for the week ended June 21 by the Railroad Commission in a summary which covered 96,937 oil wells on record that day. The total average net allowable was 1,430,934 bbl. daily.

The allowable was 59,234 bbl. daily in excess of the U. S. Bureau of Mines recommendation for June market demand. Application of an average monthly 3.5 per cent under production would place the actual yield 9,151 bbl. above the bureau's estimated demand. There were 113 new wells added to the proration schedule during the week.

TWO OIL CONSERVATION MEASURES that have caused almost continuous controversy in the current legislature were finally cleared from the calendar last week.

The Clark bill, claimed by proponents to check selective purchasing, empowers the Railroad Commission to set up a state-wide allowable and then divide the total among pools according to standards the commission may adopt, without regard to market demand for individual pools. The senate was the last to act on the measure and passage was voted by that body 21 to 6.

Senate conferees agreed last week to provisions of the house proration bill, making the basic law permanent instead of limiting its effective period to 2 years as has been practiced in the past by the Texas Legislature.

ALLOWABLE PRODUCTION in July was set June 24 by the Texas Railroad Commission at 1,347,926 bbl. daily, a reduction of 63,806 bbl. from the June 1 authorized production and 83,008 bbl. daily below the June 21 permissible. Actual production for the week ended June 21, according to estimates of The Oil and Gas Journal, was 1,422,200 bbl. daily.

The Railroad Commission ordered 11 production holidays in July for all fields in the state, except those exempt for conservation reasons, and the Panhandle where only 5 shutdown days are specified, the same as prevailing there during June.

PENNSYLVANIA

RESALE PRICES OF GASOLINE may be prescribed by the manufacturers under terms of a law made effective by signature of Gov. Arthur H. James. The law places gasoline under terms of the 1935 Fair Sales Act and requires dealers to agree not to sell motor fuel below the price stipulated by the supplying oil company. A similar law has existed in New Jersey for several years. Practice in New Jersey is to fix the minimum resale price without specifying a maximum.

FLORIDA

A BONUS OF $50,000 and a maximum of 40,000 acres of leases has been established in a law enacted by the Florida Legislature. The law provides for accrual of certain income in the hands of the Internal Improvement Fund of Florida.

The bonus law requires commercial production of oil or gas for a continuous period of at least 30 days in order for an individual operator or company to qualify for the inducements. Term of the bonus law is limited to 5 years.

Commercial production is qualified to mean quantities "that such explorer and operator may in any practical manner commercially" distribute for 30 days.

CONNALLY ACT ENFORCERS . . .

Jurisdiction of Federal Tender Board No. 1, composed of J. W. Steele, chairman, center; Col. E. W. Chatterton, left, and Ray W. Armstrong, will be extended August 1 to 102 counties in Texas, all of Louisiana and two counties in New Mexico. The board, domiciled at Kilgore, Tex., is concerned primarily with enforcement of the Connally Act which prohibits interstate movement of petroleum produced in excess of state regulation

the OIL AND GAS JOURNAL

PRODUCING REFINING NATURAL GASOLINE PIPE LINE

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The First Chapter

The initial conference of oil men with Coordinator Ickes is now history. No doubt many men went to Washington last week with grave doubts and somber forebodings, wondering what would be revealed during the meeting to which they had been invited.

By and large the conference was marked by amity and good will. Nothing emanated from the meeting that would cause thoughtful members of the industry to entertain suspicions that Mr. Ickes intends to become anything more than his title indicates. Everything that took place was such as to quell fears and implant confidence. It was apparent that Mr. Ickes realized that in this, his first appearance before a large and representative gathering of oil men since his appointment as coordinator, it was essential that he create an atmosphere of confidence if he is to enjoy a full measure of cooperation.

Perhaps the most significant single action of the conference was the steps taken to create regional oil boards, and announcement of means whereby the boards will be named. While, in truth, nothing definite has been decided upon, it is highly probable that the suggestions advanced by Mr. Ickes, that the country be divided into five regions for administrative purposes and that four committees be established in each region, will be followed. He charged the industry with the duty of nominating members of these committees, and it appears to be up to the industry to see that able and competent men are nominated.

Heartening, too, was the announcement by Acting Atty. Gen. Francis Biddle that a consent decree in the Government's antitrust suit against 22 companies, their affiliates and the American Petroleum Institute would be agreed upon soon, and that the Department of Justice would take no legal action against the oil industry without first consulting with the coordinator. If this assurance can be taken at its face value, then a large stride will have been taken to remove uncertainty and fear that have plagued the industry's steps ever since it first unwittingly ran afoul of the antitrust laws.

The whole spirit of the conference can be summed up in a paragraph from the address by Ralph K. Davies, deputy petroleum administrator, when he said: "Government and industry here have a common undertaking. Neither one can act effectively by itself. The demand is for teamwork of the highest order. Only as a joint endeavor, Government and industry cooperating completely, in a mutual undertaking to achieve objectives earnestly desired by both, can genuine success attend these efforts. And this team—Government and industry—can and will be an unbeatable combination."

Mr. Davies admitted that he was not prepared to present a comprehensive outline of the problems which confront the industry in relation to defense, nor could he propose any solutions. He warned that the problems will not be static—that they would arise from events outside the industry, and then within the industry. And while he could not give a definite answer as to how it was proposed to go about dealing with such problems, he did succeed in reassuring his listeners that they would all be approached with an open mind, and that reason and fairness would prevail. Equity, without fear or favor, would be the watchword.

With these ringing words of assurance, it is encumbent upon the industry to throw its support behind the effort to achieve whole-hearted cooperation. There should be no reservations of any kind, unless and until cause for them is forthcoming. Within the next few days it is likely that the personnel of the coordinator's staff will have been announced. These men should be oil men, largely suggested by the industry itself. These men, too, will need a full measure of cooperation. We believe it will be forthcoming.

Production, Not Markets, Pennsylvania's Problem

BRADFORD, Pa., June 24.—The drastic changes in conditions confronting the Pennsylvania region within the short space of a year were touched on in many of the talks given at the eighteenth annual convention of the Pennsylvania Grade Crude Oil Association here June 19-20.

Parker L. Melvin, of Bradford, president of the association, summed up the situation aptly in his annual address to the gathering when he said: "Last year we searched for markets—now we search for better and quicker ways of lifting crude and for processing materials producing maximum of materials."

Just a year ago, the region was feeling the effects of the virtual stoppage of exports to Europe, due to the Nazi conquest of the western part of the continent. Increased domestic demand and something of an upturn in exports—although nowhere near the amount previously shipped—has kept refinery runs ahead of production through the greater part of the present year. Today, Mr. Melvin said, "the rearmament program has drained many of our tanks and promises to take all finished products we can make for an indefinite time to come."

"Drilling is somewhat above normal but the increase will probably be halted by the inability to secure pipe and materials," he said, and added, "this problem will be serious."

He said there was renewed interest in horizontal drilling in the middle district while in the upper fields several laboratory projects are undergoing careful field experimentation.

Refiners are checking methods by which better yields can be secured without reducing quality standards. "No sacrifice of lubricating efficiency can be permitted as the price of more profitable refining practices," he declared.

Touching on the national emergency, Mr. Melvin said: "None of us either desires or expects undue profits. All that we have has been accumulated under the banner of this free republic. When the nation calls to us, we shall be ready and eager to answer that call, however it may summon us to service or to sacrifice."

J. E. Moorhead, executive secretary, told the association that the trend is definitely upward in both members of the association and licensed brands. In reviewing the past year, Mr. Moorhead said: "A year ago the Pennsylvania region was not only producing and processing more oil than it could sell; it had on hand a heavy inventory of both crude and refined stocks. We had lost most of our European markets, and our producers and refiners, individually, were trying to adjust their operations to the sudden change.

"At that time the need for a bigger and better domestic market was urgent. The association expanded its advertising program." The response, he said, was immediate. "It was felt long before the federal rearmament program was under way.

"The immediate future program of the association will follow the formula which has guided it for many years. The normal advertising program will continue. The pressing situation of last year having been relieved, the campaign will be shortened to conform to our actual income and to our policy of building up a surplus from which we can draw when the situation requires it."

J. E. Keller, of the legal staff of the association, briefly discussed the activity of that department, and told the meeting that its record is 100 per cent—not losing a single case.

Parker L. Melvin, left, reelected president of the Pennsylvania Grade Crude Oil Association; T. O. Grisell, Kendall Refining Co., center, and Dr. T. W. Lee, right, U. S. G. S. speakers at the Bradford meeting

Panel Discussion

In the panel discussion of byproducts from Pennsylvania Grade crude oil. Dr. Harrison E. Howe, editor of Industrial and Engineering Chemistry, Washington, D. C., said that crude oil is the richest field for chemistry since it has a convenient and abundant supply of hydrocarbons. The threshold of synthetic products derived from crude oil has been passed. The Pennsylvania industry, he said, has everything for a good program in development of synthetic products from its crude—established research, a progressive association and a good crude.

T. O. Grisell, Kendall Refining Co., Bradford, who replaced W. S. Zehrung, president of the Pennzoil Co., Oil City, Pa., when he was called to the conference called by Coordinator Ickes at Washington, said the problem of synthetic products from Pennsylvania industry is of utmost importance to producers and refiners. "Our problem is an economic one," he pointed out. "We have a high producing cost and our products are in competition with those of other crudes. The more costly the crude, the more the refiner must get out of a barrel. Motor oil is now bearing the refiner's burden but we must look to the future." He believed, he said, that synthetic products from crude is the Pennsylvania industry's answer to the problem.

Dean Frank C. Whitmore, of the school of chemistry and physics, Pennsylvania State College, stressed the value of research in meeting the problem of evolving synthetic products. He urged all refiners to aid in solving the problem. We must find products different from those made from other crudes, he said.

Raymond Moley, prominent in the brain trust in the early days of the first Roosevelt administration and now contributing editor of Newsweek, speaking on "American Individualism and the Oil Industry," declared there "is no substitute for private enterprise in seeking answers" to production.

He said the country had the right to know there will be no "economic revolution within the broad outline of a war. The country also has the right to know that when the emergency has passed, rules of free enterprise will be scrupulously restored for we cannot afford to preserve democracy abroad and in this effort lose democracy at home."

Improvements in Geophysical Methods

Dr. F. W. Lee, of the U. S. Geological Survey, told the association of improvements being made in geophysical methods, especially the electric ground resistivator. If plans are approved, a joint state-federal study may be made in the region by geophysical methods.

Fayette B. Dow, general counsel of the association, who attended the conference called by Coordinator Ickes on Thursday, stressed the fine spirit of amity at the gathering. From discussions among groups after the talk, the impression prevailed that interested producers, refiners, marketers, and transportation men might make recommendations for representatives on the four committees for each of the five districts into which the nation will be divided. These committees of 12 men each will make recommendations to the coordinator and his staff, but decisions will rest with the latter.

There are no priorities on materials used by the petroleum industry, P. M. Robinson, formerly employed by Pennzoil Co. and now aide to Dr. R. E. Wilson, chief petroleum consultant to the Office of Production Management, told the gathering. Asked whether it might be assumed that the oil industry was not considered important to national defense, Mr. Robinson said he felt that the industry was very important and said it was significant that the oil industry was the first for which a coordinator had been named

D. T. Ring, of the Preston Oil Co., Columbus Ohio, was elected second vice president, succeeding Hans Walchli, Wellsville, N. Y. All the other officers were reelected. They are: Parker L. Melvin, of the Towne-Melvin Oil Co., Bradford, president; A. E. Booth, Bradford, first vice president; Sam Messer, Quaker State Oil Refining Corp., Oil City, treasurer; W. R. Reitz, Quaker State Oil Refining Corp., assistant treasurer; John A. Beck, Pennsylvania Refining Co., Butler, corresponding secretary; J. E. Moorhead, Oil City, executive secretary; S. F. Pratt, Oil City, assistant secretary; and F. B. Dow, Washington, general counsel.

Watching WASHINGTON

By HENRY D. RALPH

Last Thursday's conference unmarred by discordant notes . .

May coordinate transportation facilities as first move . .

Voluntary curtailment may eliminate need for rationing . .

WASHINGTON, D. C., June 23.—All was sweetness and light, peace and harmony, at Secretary Ickes' big oil conference Thursday. On the record there was not a discordant note beyond suggestions of trouble spots to be watched.

Off the record it was just about the same. In the corridors and back in their hotel rooms the oil men continued to talk cooperation and optimism. Disgustingly so, in the opinion of one of them who thought there ought to be some fireworks.

Old timers noted the contrast with N.R.A. code meetings, which were supposed to be industrial self-government but more often resembled a dog fight. Now, when Secretary Ickes has almost unlimited authority under the Government's emergency powers, there is no suggestion of a "crackdown," intraindustry squabbles appear to be submerged, and cooperation is the word of the hour.

One after another oil men arose and expressed utmost confidence in, and pledged full cooperation to, Harold L. Ickes, the same Harold L. Ickes who for 8 years has been the chief bogey man of the oil industry, the object of its revilement, and the embodiment of its fears of government control. Believe it or not, it happened; and it appears to be genuine.

Ickes Wants to Make Good

There are a number of explanations for this phenomenon. To the secretary can be attributed a genuine desire to do a monumental piece of work in "coordinating" the oil industry. He thinks he did a pretty good job with the N.R.A. oil code, but wants to do better this time and to make his work more lasting. He has learned a lot about the oil industry during these 8 years, and apparently he has also learned that good administration depends on a groundwork of understanding, confidence, and cooperative effort.

Then, too, there is the administration's determination to preserve and glorify democratic methods here while fighting totalitarianism abroad. The phrase "the American way" was used several times during the oil conference.

On the part of the oil industry there is the exigency of national defense, the realization that business as usual is out of the picture for the duration; that sacrifices must be made, and that all resources of the nation are at the disposal of the Government.

There is also a general recognition, more felt than expressed, that Mr. Ickes is now the Great White Father of the oil industry, its protector against enemies within and without, its savior from internal disruption caused by unregulated competition and from excessive and arbitrary regulation by various agencies of the Government.

But beyond the soft speaking at Ickes' testimonial meeting last Thursday lie troubles, shocks, and heartaches. The oil industry has problems and Mr. Ickes has ideas. However, democratic and cooperative may be the process by which these problems are solved and these ideas launched, many people will be made very unhappy. Many toes will be stepped on, many cherished ideas junked, many methods of business altered. One oil man at the conference expressed the hope that the secretary would turn back the industry in the same condition as he got it, but Mr. Ickes hopes and intends to leave the oil industry in a much different and better condition, freed from much of its waste—economic waste of competition as well as physical waste of oil.

May Pool Transportation Lines

A few of the things in Mr. Ickes' mind were hinted in the address of Deputy Davies, and much may be read between the lines of his talk. He based his suggestions on the temporary needs of the defense emergency, but if the emergency lasts as long as appears likely the result may be permanent economic changes in the industry.

Elimination of wasteful crosshauling and other transportation methods is one of the instructions given the coordinator by the president, and some startling suggestions to this end may be forthcoming soon. To a certain extent all transportation facilities may be pooled through coordination of all methods and of the operations of individual companies.

Such a plan for eliminating unnecessary transportation would necessarily involve more exchange of products, which leads directly into the problem of gasoline grades, specifications, and brands. It would not be too surprising to see a proposal that all gasoline be standardized on, say, three grades, uniform regardless of brand or origin, and sold as such. This would eliminate the complaint of independent jobbers that gasoline trading and the buildup of brand names puts the independents at an unfair disadvantage.

Problems of production and conservation certainly will not be overlooked by the coordinator, and Mr. Davies dropped a few suggestions on that subject, mentioning "special conservation measures," "drilling of unnecessary wells," and "other measures" in regions where good conservation practices are not fully observed.

This thought was amplified by Secretary Ickes at a press conference the same day, when a reporter remarked that Illinois drillers were having difficulty obtaining steel and asked if priorities would be granted for this purpose. "That assumes," said the secretary, "that it is necessary to bring in more wells to supply our needs at this time. After all, Illinois has been wasting its oil at a criminal rate, and the question would arise whether or not we ought to prefer a field where we know that there has been such waste. I would say as a general policy that if priorities are granted, preference should be given to fields with good conservation practices. First on the list ought to be those companies which bring in oil on the conservation basis with the least possible waste. That is just common sense."

But he tempered these remarks somewhat when a reporter asked him if this is the prelude to a "crackdown" on Illinois and possibly California, too, for he replied: "No, it is not a prelude, and it would not be a 'crackdown' anyhow."

The secretary added that he has not yet done anything about priorities for the oil industry beyond sending a letter to the O.P.M. asking to be advised of any applications for priorities affecting the oil industry.

Uppermost in the minds of distributors and the general public throughout the East is the rumor that rationing of gasoline and fuel oil may be imposed. It is no secret that plans for such are being studied in the coordinator's office, but so far as can be learned this is only a precautionary measure, and Mr. Ickes hopes such a step will not be necessary. He is counting on voluntary curtailment and more efficient use to bridge the gap until more transportation facilities can be brought into use.

Discuss Texas-New York Line

However, it now appears that these additional transportation facilities may be of less capacity and longer in completion than had been hoped. Representatives of major oil companies met with Secretary Ickes last week to discuss construction of a Texas-New York pipe line, and will meet again this week, but there are wide differences of opinion as to the size of the line, its location, its financing and its method of operation. Instead of a 24-in. crude line and a parallel 20-in. products line, there may be only a products line and this no larger than 16 in., because of difficulties of obtaining steel and the prospect of uneconomic operation of either line when more tankers become available. A 16-in. pipe is said to be the largest which can be made with steel from continuous-strip mills, and it is reported that pipe of this size can be obtained at the rate of 12 miles per day. The inference is that there would be long delays in obtaining larger pipe, which must be made from the product of steel plate mills which are now working to capacity on plates for ships, tanks, and other essential projects. On the other hand, there is a report that the new line may be so constructed that it could be converted to carry natural gas after the emergency and this might make it economically feasible to go ahead with the original plans for two large lines.

Canada's Oil Supply Lines Free From War's Hazards

By J. P. O'DONNELL

The Canadian petroleum industry, dependent on imports for about 85 per cent of its internal requirements, has operated since June 28, 1940, under supervision of a central director with extensive authority. Restrictions imposed on the industry, although comparatively simple in view of the necessity for drawing bulk of supplies from outside sources, are reviewed here. Production of crude oil and natural gasoline in the first 2 months this year totaled 1,539,965 bbl., an increase of 34.8 per cent.

OF all the major countries involved in the war, Canada alone has an adequate supply of petroleum and products available without possible interruption from submarine or aerial warfare. In this respect, its position, with one notable exception, is similar to that in which the United States would find itself if this country entered the war. That exception is that, while Canada has an ample supply available, a large part must be imported, whereas the United States' supply is within its own borders.

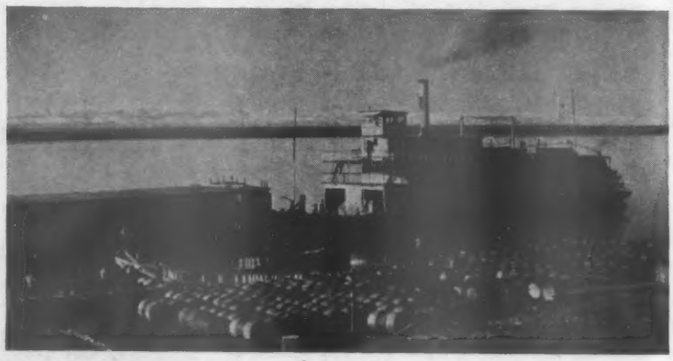
At the end of 20 months of war there is no rationing of petroleum products in Canada. In fact gasoline consumption has shown a remarkable increase during the past year. It is not improbable that some sort of rationing may be instituted but if it is it will be because of a condition that could not affect this country. Approximately 85 per cent of Canada's oil requirements are met by imports. The value of these imports in 1939 was $56,875,714. Expenditure of this sum outside the empire means a corresponding loss in foreign exchange which must be conserved as far as possible "for the purchase of essential wartime imports," a problem with which the United States would not be faced, at least with respect to oil.

Possibility of Rationing

The possibility of rationing in Canada has been heightened by the increasingly tight tanker situation in the Western Hemisphere resulting from the diversion of United States' boats to British use. One result of this situation has been the elimination of the pipe-line shipments of Venezuelan crude from Marcus Hook, Pa., to Sarnia, Ont., since part of this system has been taken over to replace tankers in the interstate movement of crude oil in the United States. The Venezuelan crude has been replaced by additional purchases of oil in the United States. If the tanker situation becomes more critical, Canada may find it increasingly necessary to take United States crude in preference to that now being brought up from South America.

Construction of the pipe line from Portland, Me., to Montreal, Que., for which contracts have been let, will ease Canada's position. The tanker route from such points as Curacao, Aruba, the Lake Maracaibo area in Venezuela, and Cartagena and Covenas in Colombia to Portland is no longer than the route from Houston. Thus, lower-cost South American oil can be transported as easily and as cheaply as Gulf Coast oil.

Right: Loading oil drums at Fort Norman, where Imperial Oil, Ltd., has a refinery, for distribution along the Mackenzie River, Northwest Territories, Canada



Below: A typical producing-well hookup in the Turner Valley field, Alberta, Canada, the source of a bulk of the oil indigenous to the country

The line across Maine will be 12-in. diameter and will have a capacity of 50,000 bbl. per day. Montreal with its five refineries having a combined capacity of 67,000 bbl. per day, is Canada's principal refining center. This line will eliminate the long tanker haul around Nova Scotia and down the St. Lawrence to Montreal and will be capable of providing 75 per cent of these refineries requirements.

Deliveries of Venezuelan crude via the Marcus Hook-Sarnia system were conducted for a period of 5 months, having started December 1, 1940, and having ended early in May. It was reported that 10,000 bbl. per day was being moved in this route which would make the total for that period 1,500,000 bbl. Had it been continued Venezuela's share of the Canadian crude market would have been substantially increased.

Canada's Position Explained

Canada's position from an importing standpoint was described in a speech last December by Finance Minister J. L. Ilsley in which he said: "I must also point out that while we are temporarily compelled to restrict certain imports from our friendly neighbor to the south, this does not mean that our total trade with that country will be reduced. . . . All that will happen will be a shift in the character of our imports—a reduction in nonessential imports for nonwar purposes in

PENBERTHY

DROP FORGED STEEL

TRANSPARENT

LIQUID LEVEL GAGES

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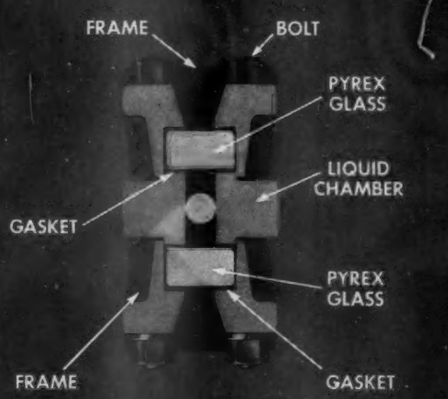

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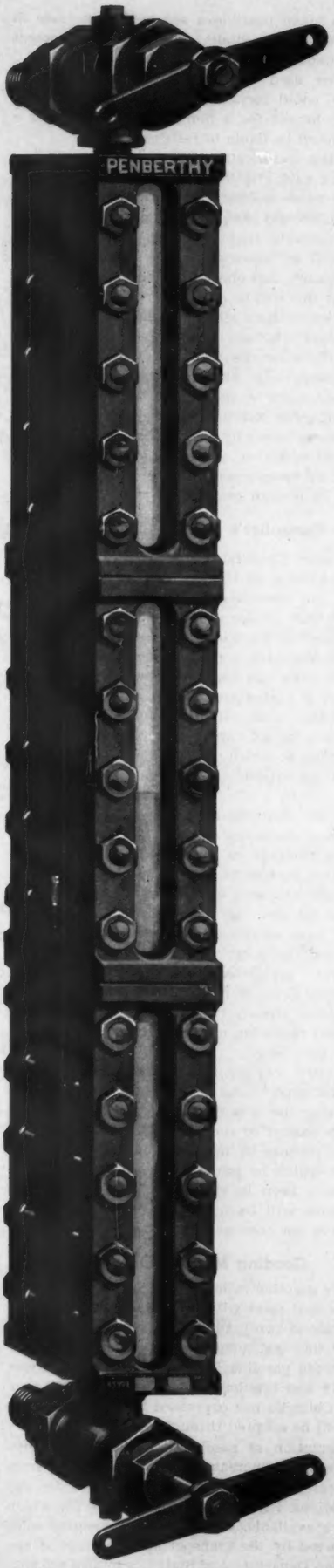

PENBERTHY INJECTOR COMPANY

DETROIT, MICHIGAN

PENBERTHY PRODUCTS

CANADIAN PLANT: WINDSOR, ONTARIO

order to make possible a substantial increase in our purchases of vitally needed war equipment and supplies."

Gasoline used for pleasure-car operation, for example, could certainly be classified as a nonessential import for a nonwar purpose and as a result would be liable to restriction.

Speaking specifically of Canada's oil situation, Mr. Ilsley said: "With regard to petroleum products the whole matter is much more complicated, but I understand that the oil controller is making plans to ensure that all our petroleum requirements will be imported in the most economical form possible, and plans are going forward to ensure that this will be done without burden to consumers or without discrimination against those distributors who are now using imported gasoline. Permits for the importation of gasoline will be restricted only after equitable arrangements have been made by the oil controller for the supplying of these distributors. Through the control placed in its hands by this legislation, the government will endeavor to satisfy the nation's gasoline and oil requirements for the smallest possible amount of foreign exchange."

Controller's Powers Complete

The entire Canadian oil industry is now under the supervision of G. R. Cottrelle, who was appointed oil controller by the governor general June 28, 1940, under provisions conferred by the Department of Munitions and Supply Act and by the War Measures Act. The order appointing Mr. Cottrelle gave him complete powers over the oil industry. It authorized him to requisition plants and supplies, to actually deal in oil, to fix amounts which may be sold and the maximum and minimum prices at which they may be sold, to license imports and exports and, if necessary, to prohibit them.

Since Mr. Cottrelle took office few restrictions have been placed on the oil industry indicating that the findings of the McGillivray-Lipsett investigation in Alberta, which held that the oil industry did not need state control, were justified. Erection of new service stations, the installation of new equipment in existing service stations and the erection of bulk storage plants has been prohibited and the sale of fuel oil limited. Sales of fuel oil have been limited to installations already in operation and to new installations requiring not more than 4,000 imperial gallons per year.

Machinery was put into operation in December to control exports and imports by the government prohibiting the importation of crude oil and its products except in such cases as the minister of national revenue in his discretion deems advisable and for which he issues a permit. These regulations have been in effect for 4 months. Likely, regulations will be used to reduce imports, but they have not been as yet.

Grading May Be Ordered

Before gasoline rationing becomes effective it is possible that sales will be limited on a dominion-wide scale to two grades. The Province of Alberta already has instituted grading. It specified premium-grade gasoline in an octane range of from 75 to 78 and regular grade from 66 to 70. Controller Cottrelle has expressed the hope that this basis will be adopted throughout the dominion.

Consumption of gasoline in Canada has benefitted from the increased pay rolls resulting from the greater industrial activity incident to war preparations. In the 11 months of 1940 for which data are available, Canada's retail gasoline sales as reported by the transportation branch of the Dominion Department of Statistics totaled 825,927,000 gal., an increase over the total for the full 12 months of 1939 and an increase of 9.8 per cent from the total for the corresponding 11 months of 1939. This contrasts with an increase of 6 per cent in the United States' domestic consumption.

The record of Canadian gasoline consumption for the past 2 years follows:

RETAIL GASOLINE CONSUMPTION
(In thous. of imperial gallons)

Month—	1939	1940
January	40,078	44,773
February	33,452	41,690
March	43,066	43,823
April	48,867	56,040
May	78,810	91,111
June	77,669	88,000
July	87,259	93,329
August	97,200	103,428
September	95,290	97,901
October	82,708	94,116
November	67,842	71,706
December	55,425	.....
Total	752,241	825,927

This increase has been met by greater domestic production of gasoline. Information on gasoline production is not available but the fact that it has increased is apparent from the increase in the crude-oil charging capacity of Canada's refineries. The Oil and Gas Journal's refinery survey revealed that the crude capacity increased 36,000 bbl. or 18.5 per cent from March 1, 1940, to March 1, 1941. In addition several refineries have increased their lubricating oil capacity. Lubricating oils are refined principally from Mid-Continent and Illinois crudes since it is much cheaper to import and process this crude than it is to buy finished lubricating oils abroad.

Crude Imports Save Exchange

Lubricating oils and gasoline are the most expensive of the major oil imports of Canada on a per-gallon basis. Canada paid an average of 21.9 cents per gallon for lubricating oil and 7.3 cents per gallon for gasoline imported in 1939 against an average of 3 cents per gallon for crude oil. Anything that can be done to curtail finished-products imports would assist in protecting the foreign exchange spent for them. It amounted to $17,500,000 in 1939.

Information regarding Canada's imports is not readily available. The Dominion Bureau of Statistics discontinued its report on imports following the issuance of that for April 1940 "as petroleum and its products are considered essential war materials."

In the first 4 months of 1940, 83 per cent of the crude oil of 0.8155° specific gravity, representing the bulk of the crude which Canada imports, came from the United States, about 13 per cent from Colombia and the remainder from Peru and Venezuela.

United States Big Supplier

Canada's imports of crude oil from the United States increased moderately in 1940 and those from Colombia advanced sharply from 5,148,000 bbl. in 1939 to 9,097,000 bbl. in 1940. This volume, however, is small compared to the quantities shipped from this country: 28,120,634 bbl. in 1939 and 28,778,148 bbl. in 1940.

Canada's apparent policy is to reduce imports of the high cost United States oil in favor of less expensive oil from other sources. This was indicated by the imposition of a 10 per cent import duty on all crude oil and refined products from nonempire countries. This is easily understandable in view of Canada's vital need for foreign exchange conservation. Finance Minister Ilsley voiced the assurance that this is a temporary wartime expedient when he said "We have no desire or intention in the measures which we must take for war purposes of implying any permanent change in our normal trade policies, the principles of which are well known."

Canada has given evidence that she is slow to make any drastic change for her imports from the United States, especially of residual fuel oil, increased in 1940 from 1939. Only gasoline, off about 16 per cent, showed an appreciable decline. A comparison of our exports to Canada in the last few years follows:

Product—	1938	1939	1940
Motor fuel	3,276,002	2,962,739	2,487,145
Lube oils	485,944	523,702	546,642
Gas oil	562,906	569,060	539,243
Residual fuel oil	964,743	610,779	1,643,888
Kerosene	229,420	189,069	186,251
Total refined	5,519,015	4,855,349	5,403,169
Crude oil	24,845,141	28,120,634	28,778,149
All oils	30,364,156	32,975,980	34,181,318

Canada's policy is double-barreled in that it seeks to stimulate domestic production as well as curtail imports. In the former she has been successful. Canada's crude-oil production of 8,718,709 bbl. in 1940 was the highest on record. It was an increase of 11.2 per cent from the 1939 total of 7,838,645 bbl. This increase was accounted for entirely by the Turner Valley field where production from limestone wells rose 917,253 bbl.

Drilling Activity Stimulated

Drilling activity, both in proven and unproven areas, is considerable. Percentage of successful holes in Turner Valley, in recent years, has been high. Out of 140 wells drilled in the last 4½ years only 6 were abandoned as unproductive, 4 were gassers and the remaining 130 were oil wells. During 1940, in Alberta, 370,104 ft. were drilled in 102 new holes. One of the most successful of the wildcat wells was the Standard Oil Co. of British Columbia 2 Princess, LSD 3, 13-20-12w4, in the Steveville area. This well, completed early in January this year, produced 520 bbl. per day of 26.3° A.P.I. gravity oil from 3,290 ft. in the Madison. It has been recognized as a pool opener by the government's petroleum and natural-gas conservation board.

Prospects of greater exploration and development activity have been enhanced by a new policy recently outlined by the Ministry of Lands and Mines. This policy, designed expressly to stimulate the much needed exploration work, provides in one section of the seven-point program that a bonus system will be established whereby discovery wells will be exempt from certain royalty payments or the drilling company may credit its cost against rentals.

A comparison of Canada's production of crude oil for the past 2 years follows:

(Figures (in barrels.)

Alberta:	1939	1940
Turner Valley limestone	7,180,161	8,097,414
Turner Valley gas wells	367,437	347,804
Turner Valley shallow	8,431	7,309
Red Coulee light	13,022	12,177
Wainwright, Ribstone heavy	15,041	12,273
Taber, Moose dome, Lloydminster, Steveville, Del Bonita, Vermilion heavy	10,319	16,260
Total	7,594,411	8,493,237
Northwest Territories	18,155	17,840
New Brunswick	20,101	21,161
Ontario	205,978	186,471
Canada	7,837,503	8,718,053

The rationing of gasoline in Canada is a possibility and such a policy will probably be adopted when and if the need for foreign exchange conservation becomes sufficiently acute. Rationing discussions thus far, however, it is well to point out, have only been on voluntary methods. Imports from the United States will probably decline but Canada will continue to need large amounts of United States oil at least until restrictions on consumption are applied. Producers and refiners here continue to get United States dollars for their exports and, when the war is over, they may expect, as Mr. Ilsley indicates, to regain what they may lose if Canada finds it necessary to curtail her imports from this country.

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Rail Interests Oppose Pipe Lines at Senate Hearing

WASHINGTON, D. C., June 23.—Railroad interests continued their opposition to the Cole pipe-line bill at hearings today before the Senate interstate commerce committee.

W. L. Stanley, vice president of Seaboard Air Line, asserted construction of pipe lines in the Southeast is a commercial and economic question without national-defense significance. He said there is absolutely no necessity for pipe lines in the Southeast since only 12 tankers are in this trade and railroads can handle this with half their idle tank cars. In the Northeast, he said, present pipe lines can carry most of the oil now moving by tanker and railroads can handle the rest. He asserted pipe lines in the Southeast would make 11,000 rail workers unemployed and the public would not benefit by lower prices.

Mr. Stanley asked that if bill is approved it be amended to set up administrative body to permit opposition to give evidence that particular lines are not necessary before the president grants power of eminent domain, that Government only and not private interests be permitted to build new pipe lines, and that after 2 years, oil companies not be permitted to own any new pipe lines.

John T. Corbett, legislative representative of Brotherhood of Railway Engineers, said this is not a defense measure but a continuation of a losing battle oil companies made against rail interests in Georgia. Implying doubt that 50 tankers have been transferred to British service, he said in 1939 United States and England had more than 50 per cent of number and tonnage of world's tankers so there ought to be no shortage, and suggested that the bill be held up until termination of the German-Russian war to see if it is needed then. He said bill is unfair to railroads who have thousands of idle tank cars and asked amendment to prevent pipe lines carrying oil owned by them.

J. G. Luhrsen, secretary of Railway Labor Executives Association, insisted defense angle to bill is vague, and read letter from Navy Secretary Knox stating that Navy intended to supply Norfolk base with fuel oil by barge from Philadelphia, Pa., which Mr. Luhrsen said comes to Philadelphia by pipe line.

Sen. Tom Stewart of Tennessee inserted letters from constituents asking bill be amended to include natural-gas lines and declared Mr. Ickes and O.P.M. do not object to such amendment.

Sen. Chan Gurney of South Dakota suggested that pipe lines from Texas to Northwest be opened at intermediate points to permit loading tank trucks, saying this would relieve the tanker situation, and also suggested that the Government commandeer all oil-transportation facilities and control routings to eliminate unnecessary and crosshauling.

The hearing adjourned on call of chairman without date set for further action.

Export Regulation Affects Lube Oils Chiefly

NEW YORK, June 24.—The request addressed by Deputy Petroleum Coordinator Ralph K. Davies to 32 East Coast oil companies asking them to refrain from exporting oil products without prior consideration of the coordinator's office will affect lubricating oils principally. More lubricating oils are exported from northeastern United States customs districts than from any other section of the country and fully four-fifths of all petroleum products exported from that region in the last month for which data were available were lubricating oils.

Mr. Davies' request was a forerunner to the order issued by President Roosevelt Friday which placed all petroleum products under export control and banned shipments of these products from the East Coast to all countries outside of the British Empire, Egypt and the Western Hemisphere. While this action was described as a move "to meet a threatened shortage of petroleum products in the eastern United States" it was generally regarded as having the more important purpose of providing the administration with another weapon to use in Far East diplomacy. This opinion is substantiated by the fact that the ban would result in the saving of less than 3,500,000 bbl. a year, about 2 days' supply for the eastern seaboard.

In March, 412,716 bbl. of lubricating oils were exported from North Atlantic Coast ports. This amount represents 81 per cent of all liquid petroleum products shipped abroad from that region.

Lubricating-oil exports from North Atlantic ports represent 61 per cent of all United States exports of lubes and, likewise, that despite the large quantity of lube oils, North Atlantic petroleum exports are less than 9 per cent of the total shipped from this country.

The preponderance of lubricating oils in the North Atlantic petroleum export total is accounted for by two facts. The more important of these is that a large proportion of the country's lubricating-oil processing facilities are located in this area. In recent years East Coast refiners have represented approximately 26 per cent and Appalachian district refineries 17.5 per cent of the United States lube-oil processing facilities, a total of 43.5 per cent. This is almost double the percentage represented by the Gulf Coast refining district, 23 per cent, even though refineries in the Texas and Louisiana Gulf region have approximately 50 per cent greater capacity than that of the combined East Coast and Appalachian districts.

Lubricating oil refining capacity has centered in the Northeast for several reasons, among them being the accessibility of high lubricant-yielding Pennsylvania crude oil. Another reason has been that the United States exports a larger proportionate share of lubricating oils than any other liquid petroleum product and that Europe, the largest peacetime customer for lubes, is most easily served from the East Coast. In 1939 better than 33⅓ per cent of the total demand for United States lubes was foreign and of the 14 countries taking in excess of 250,000 bbl. annually, nine were European.

The second reason why lubricating-oil exports from the East Coast are disproportionately high is that a large part of these exports is made in containers aboard general cargo vessels. These vessels take on a mixed cargo of commodities which may include lube oils and the latter, like the others, are assembled at East Coast ports in a normal trade movement to gather a miscellaneous cargo at the most convenient point for such vessels. Some of these lubricating oils are brought up from the Gulf, packaged on the East Coast and shipped abroad in containers.

This may appear to be inefficient for general cargo vessels bound for Pacific ports via the Panama Canal, but a glance at the map reveals that such vessel would find it necessary to almost double the length of the trip between a North Atlantic port and the canal in order to pick up a fractional cargo at the Gulf. This would be especially impractical when, as is frequently the case, the lube-oil portion of the cargo is small. Actually exports in this category represent only a fraction of 1 per cent of our total petroleum exports but they are important in aggregate from a lubricating oil standpoint.

United Kingdom Chief Importer

Virtually all bulk lubricating-oil exports from the Atlantic Coast are now going to the United Kingdom, the principal customer for United States lubricating oils. The United Kingdom took more than 196,000 bbl. in March, an amount equivalent to 47.5 per cent of the total exported from the Atlantic Coast. Curtailing of these exports would accomplish nothing since such action would merely increase the burden on the British "shuttle service" between Gulf and North Atlantic ports and thereby increase her needs for United States tankers.

So far as exports of other petroleum products from the East Coast are concerned, the effect of even a complete stoppage of foreign shipments would be negligible. In March these shipments averaged slightly more than 3,000 bbl. per day, about one-fifth of 1 per cent of the daily East Coast demand for crude oil and refined products from the Gulf this year.

Mr. Davies' telegram to the oil companies was prompted by a protest from a Pennsylvania concern complaining against shipments of oil to Japan from the East Coast when the concern was unable to fill its own requirements. As a result the Japanese vessel, Azuma Maru, was prevented from loading a cargo of 6,000 bbl. of lubricating oil. This was accomplished through the combined efforts of the coordinator's office, the oil companies, the Treasury and the Coast Guard.

Mr. Davies' wire read: "In view of the impending petroleum shortage in the Atlantic Coast area, it is imperative that drainage of stocks from this region be avoided. I suggest therefore that no further sales of petroleum products for offshore shipment be made without prior consideration by this office." Mr. Ickes has no authority by law to halt such shipments but was given ready cooperation by oil companies.

According to reports, the ban will affect 10 vessels in Philadelphia Harbor which are scheduled to load in the near future with part of their cargo consisting of petroleum products. Seven of the ten are Japanese and the other three are Danish vessels.

The relative unimportance of Japan in this instance, however, is shown by the fact that in the 6 months ended with March, only 70,015 bbl. of lubricating oil were shipped from Philadelphia to Japan.

Crude Demand Advanced In Mid-Continent District

THE forecast of demand for crude oil in July from four southern producing states was reduced 73,800 bbl. daily, indicating a trend caused by diversion of coastwise tankers. Higher demand forecast by the Bureau of Mines in other states more than offset the reductions in Texas, Louisiana, Arkansas and New Mexico.

The most substantial increases were forecast for Illinois and Oklahoma where, the Bureau of Mines estimated, demand would advance 39,500 bbl. and 38,800 bbl. daily, respectively. Part of the higher demand from the two states is expected to come from storage. An increase of 9,500 bbl. daily was forecast for California which, because of an understanding worked out among principals to an intercoastal sales contract halting Panama Canal traffic, was not entirely expected.

"The effects of readjustments in transportation and consumption resulting from the withdrawal of tankers from the gulf to East Coast movement," the Bureau of Mines declared, "are still too indefinite to be accurately measured.

"The ultimate change in the market demand for crude from the states supplying the gulf and East Coast areas will depend on the speed with which transportation readjustments become effective and also upon the extent to which the diverted tankers may move products directly from the Gulf Coast for British use or for our own increasing naval requirements."

Domestic demand for motor fuel in July is estimated at 60,300,000 bbl., an increase of 12 per cent over the abnormally low actual demand in July 1940, but an increase of 10 per cent over the estimated normal for that month.

The breakdown of the total estimated daily demand for domestic crude oil of 3,847,100 bbl. gives the following crude requirements by states of origin.

ESTIMATED DAILY AVERAGE CRUDE-OIL DEMAND BY STATES

State—	Barrels daily — Forecast July 1941	Forecast June 1941	Actual July 1940
Texas	1,324,000	1,371,700	1,284,100
California	624,800	615,300	594,800
Oklahoma	498,500	459,700	399,500
Illinois	384,800	345,300	453,400
Louisiana	304,000	319,700	278,900
Kansas	225,300	220,400	183,100
New Mexico	108,600	113,000	108,000
Wyoming	88,400	89,300	68,300
Arkansas	77,000	83,000	75,700
Pennsylvania	48,300	48,000	42,000
Michigan	37,200	38,000	52,700
Indiana	22,200	22,000	9,500
Mississippi	21,000	23,300	5,200
Montana	19,900	19,700	20,400
Kentucky	16,200	16,300	11,300
New York	15,000	14,000	11,600
West Virginia	10,800	11,000	10,300
Ohio	10,800	11,000	7,500
Colorado	5,100	5,000	3,700
Nebraska	4,200	4,300	.....
Others	.....	.....	400
Total	3,847,100	3,830,000	3,620,400

DEATHS

WALTER E. HURD, 55, one of the organizers of the Homestead Oil & Gas Co. of Texas and the Homestead Oil & Gas Co., Ltd., of Canada, died at his home in Fort Worth, Tex., June 19. A native Pennsylvanian, Mr. Hurd spent most of his life at Narbeth, Pa., although for many years he maintained an office in Toronto, Ont., from which he managed extensive gold and silver mining interests. He also engaged in the oil business in Pennsylvania. Mr. Hurd was also an organizer of the Tex-Tor Oil Corp. and the Caddo Oil Corp., which have headquarters in Fort Worth.

R. HOUSTON FOSTER, 59, executive vice president of Landreth Production Corp., died June 19 in a Rochester, Minn., hospital from complications resulting after an operation. Mr. Foster, in addition to his oil interests, was an attorney, and was president of the Texas Christian University board of regents, and a director of the Independent Petroleum Association of America. His wife and a daughter survive.

PERCY S. HAZLETT, 60, general superintendent of the Hope Construction & Refining Co., of Bremen, Ohio, and general supervisor of Standard Oil refineries in Ohio and West Virginia, died at Lancaster, Ohio, June 17. He is survived by his widow, a daughter and two sons.

HOMER T. LAMB, SR., 63, retired Tulsa oil man and one of the pioneers who came from Pennsylvania, died at his home in Tulsa June 23, following a heart ailment. Mr. Lamb, who was born in Clarion, Pa., began roustabouting when he was a boy. From Pennsylvania he followed development of oil west, in Indiana and Illinois, and in Kansas. Later he went to Wyoming and drilled the first well on the Teapot Dome structure. He came to Tulsa 20 years ago. He was at one time president of the Red Bank Oil Co., which company he organized in 1917. The company operated in Kansas, Oklahoma, Texas, Louisiana and Arkansas. Mr. Lamb is survived by his widow, a son, Homer T. Lamb, Jr., of Houston, Tex., and two daughters.

SOMERS H. SMITH, 44, employe of the auditing department of Stanolind Oil & Gas Co., Tulsa, died June 22 in a Tulsa hospital after a short illness. He had been a resident of Tulsa for 20 years, and until his joining Stanolind 6 years ago, was affiliated with the Burke-Greis Oil Corp. His widow, a son and a daughter survive.

JAMES RAWSON, 80, died at Windsor, Ont., Canada, last week. Born in the Petrolia field at the time of the first oil discoveries, he learned drilling with the old spring-pole outfit and later drilled in Borneo.

ANDREW D. WOLSEY, 60, died last week at Woodstock, Ont., Canada. A driller since he was 19, he worked in Mexico, Venezuela, Borneo, Persia, Africa, Java, Sumatra, Trinidad, Mesopotamia, Egypt, and Canada.

PAUL A. RITTER, employe of Pan American Pipe Line Co., Houston, Tex., died June 17 from a bullet wound received in his home. Mr. Ritter was a native of New York, and attended school in Tokio, Japan, and was graduated from the University of California. He was a member of the American Society of Mechanical Engineers. His wife, a son and a daughter survive.

WALTER K. CAMPBELL, McAllen, Tex., oil refiner and well-equipment supplier, died recently, following a brief illness. Mr. Campbell operated the Rado Refining Co. several years ago, and since he sold his interests has been in the oil-well servicing business in the Sam Fordyce field. His widow, a son and a daughter are among the survivors.

PHIL A. WARD, 46, treasurer of the Great Lakes Pipe Line Co., Kansas City, Mo., died June 18, a few minutes after listening to the final round of the Louis-Conn fight. Mr. Ward was born in Great Bend, Kans., and moved to Kansas City in 1931 from Ponca City, Okla., where he had been with Continental Oil Co. At different times in his career he was associated with Ohio Oil Co., Illinois Pipe Line Co., and Standard Oil Co.

WILLIAM H. HAGERTY, 74, retired employe of the National Transit Pump & Machine Co., Oil City, Pa., died at his home at Pinoak, Pa., June 17. He had been ill several months. He was born in 1866, and had been employed by National Transit for many years prior to his retirement 11 years ago. Four sons and a daughter survive.

W. ARTHUR EIDSON, 64, well-known oil producer, died at his home in Minard Run, Pa., last week. He had been subject to a heart condition for several years but his death was unexpected. An oil operator for many years, he owned oil property in Minard Run at the time of his death. His widow, three sons and a daughter survive.

REVIS JAMES, 37, secretary and treasurer of the T. W. M. Oil Producing Co., and general superintendent of the W. R. R. Oil Co., Dallas, Tex., was killed June 20 when his automobile skidded off a slippery pavement near Corpus Christi, Tex. Survivors include the widow and two sons.

Postpone Pipe-Line Conference Until June 26

Representatives of major oil companies who met with Deputy Coordinator Ralph K. Davies last week, and who were to meet again on Monday of this week, to consider proposals for constructing new pipe lines between Texas and the Atlantic Coast, notified Mr. Davies that they wished more time to consider the proposition. Consequently, the date of the second meeting has been postponed until Thursday. There were differences of opinion as to routes, types of line and capacity suitable to the projects, and these differences need to be straightened out before the second meeting is held.

THE MARKETS*

CRUDE OIL: Advances of 3 to 6 cents per barrel in the posted price for Kentucky crude oil and adoption of the 20-cent increase by all purchasers in the eastern producing area are added evidences of market strength. Substantial advances in the estimated demand for Oklahoma and Illinois crude oil next month promises to test resistivity of current Mid-Continent prices.

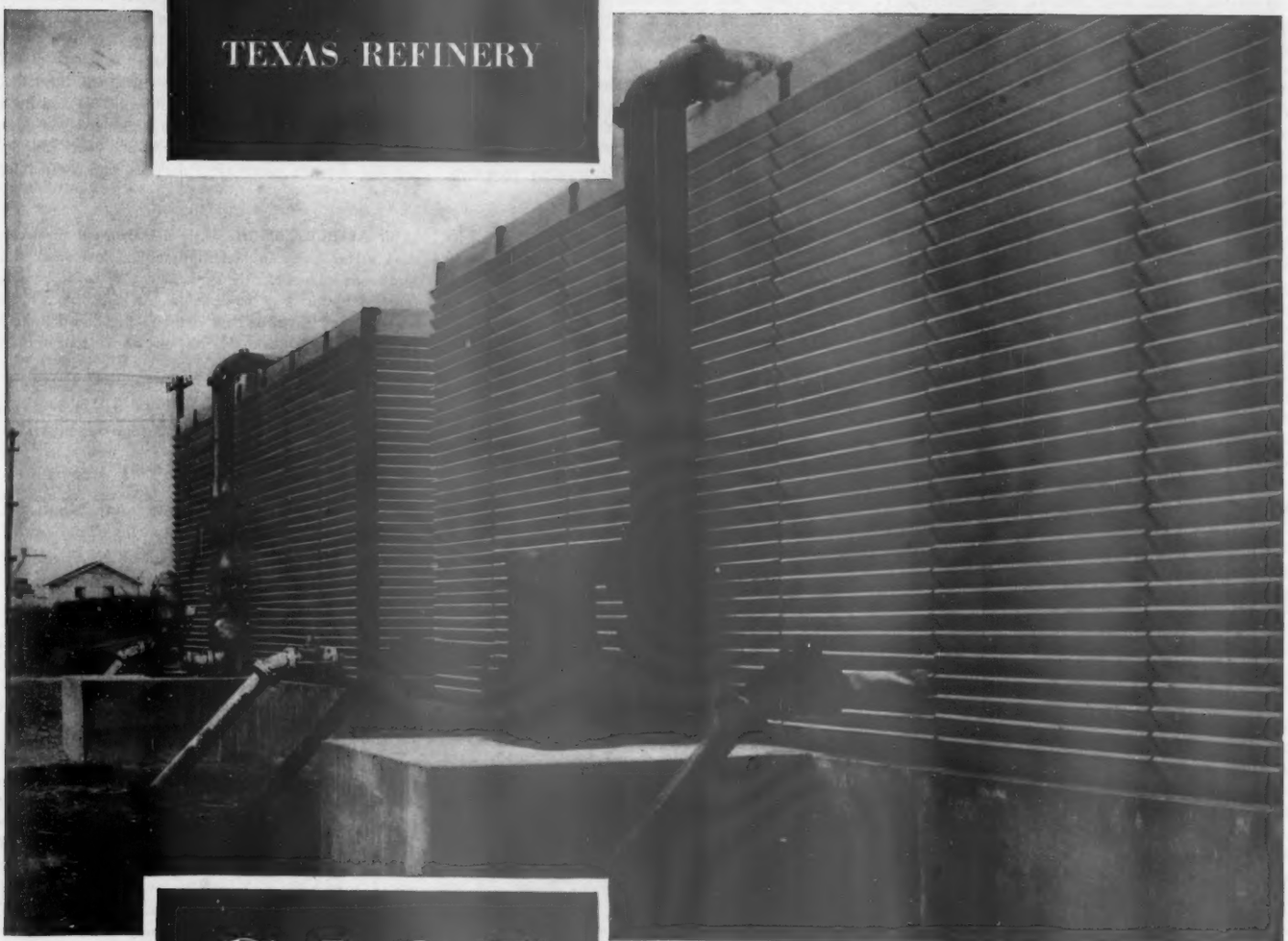
REFINERY: Gasoline prices are steady in most sections of the country but lubricating-oil quotations have been advanced 1 cent per gallon in Oklahoma and Pennsylvania. Motor-fuel prices on the eastern coast would go higher, observers believe, if Leon Henderson, director of the Office of Price Administration and Civilian Supply, had not made a suggestion that all advances be submitted to his department before they are made effective.

TANK-WAGON AND POSTED DEALER: Consumer and dealer prices were advanced 0.5 cent last week at several points in Nebraska. Elsewhere, prices in this market were static for the first time since general improvement was launched last March.

FINANCIAL: Fractional losses were sustained last week by oil securities. Average of 30 representative stocks for week ended June 21: High, 25.31; low, 24.67; close, 24.88. Week ended June 14: High, 25.35; low, 24.37; close, 25.12.

*Detailed information in Market Section.

CAST IRON PIPE USED IN COOLING TOWERS OF A TEXAS REFINERY



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Natural Gas News

Utilization of McKamie Gas Expected Soon

EL DORADO, Ark.—The Carter Oil Co. announced at a state-wide hearing of the Arkansas Oil and Gas Commission last week, that negotiations for construction of a treating plant for McKamie gas were near completion. The company, which holds considerable acreage in the gas-condensate field, has been conducting tests on McKamie gas and by July 1, expects to have completed a contract with a company which will use extracted sulfur for chemical uses. Following consummation of the contract, another contract will be made with the Girdler Corp. for construction of a Girbotol process plant.

The treating plant will remove most of the 4,250 grains of hydrogen sulfide per 100 cu. ft. and will sufficiently sweeten the gas for use as fuel in a power plant at Stamps, Ark. The power plant will take 8,000,000 cu. ft. daily. Further uses for power-plant consumption are being planned.

The original unit contracted in the field will treat 25,000,000 cu. ft. daily, but upon completion of an outpost well now drilling, the size of the plant will be doubled. The outpost well, if completed, will prove sufficient reserves of gas to justify the larger plant.

McKamie produces gas with a higher hydrogen sulfide content than that found in any other major gas reserve. The field at present development stages is estimated to contain 700,000,000,000 cu. ft. of recoverable gas.

Northwestern Utilities Plans Gas-Lines Extension

EDMONTON, Alta.—Northwestern Utilities, Ltd., will spend approximately $371,900 this season on improvements to its natural-gas system. The outlays include $191,700 for duplication of 9½ miles of the transmission line to the Viking field. Other items include $37,000 on new meters, mains, and extensions in Edmonton, $102,000 for drilling five wells in the Kinsella field, and a number of smaller items.

In addition the company will, if the necessary franchises are approved, spend approximately $1,500,000 on a new 100-mile transmission line and local distribution facilities to serve communities between Vegreville and Red Deer, Alta.

Refinery News

Petroleum and Coal Defense Plants Cost $21,208,000

Facilities for production of petroleum and coal derivatives with direct connection to the national-defense program involve expenditures of $21,208,000, according to a tabulation from the Office of Production Management extending through the end of April. The tabulation includes government plants costing $13,933,000 and private construction representing $7,275,000.

Plants constructed by private capital in the summary include only those for which certificates of necessity have been issued. Other privately financed plants built by the petroleum industry or now under construction are not included in the cost figures, although they may, as in the case of certain facilities for producing 100-octane gasoline, have an indirect relationship to the defense program.

Government and private expenditures authorized for construction of chemical plants, including those for manufacturing explosives, total $356,958,000. There are no details showing what portion of the outlay for chemical plants may be assigned to the petroleum industry, although several installations for production of toluene have been and are being constructed.

Home Oil Refinery at Great Falls, Mont., Bought by A. B. Cobb

GREAT FALLS, Mont.—Purchase of the Home Oil & Refining Co. refinery at Great Falls and the Pondera field properties of Rice Oil Co. by A. B. Cobb & Co. was announced here last week by Mr. Cobb. Included in the transaction were a pipe line from the Pondera properties to a loading rack at Conrad. 75 producing wells with a present production of about 450 bbl. daily and retail outlets covering the Great Falls trade territory, totaling 40 service stations and bulk plants.

In addition to the 1,500-bbl. refinery bought from Home Oil, the Cobb company acquired the 500-bbl. skimming plant formerly operated by Conrad Refining Co. at Conrad, Mont., but which has been shut down for several years. Amount of consideration was not announced, but it was reported to involve about $1,000,000.

Construction of a new crude still is now in progress to increase the daily capacity of the Great Falls refinery to 3,000 bbl. per day. The straightrun capacity has been too small for the cracking plant, a 1,200-bbl. Dubbs unit. The Home plant was established in 1930 and has been several times rebuilt and modernized, including installation of a polymerization unit. It also has a road oil unit.

Ark-La-Tex Office of W.P.R.A. Moved to Tulsa

Effective July 1, 1941, the Shreveport office of the W.P.R.A. will be consolidated with the Tulsa office. L. C. Grosjean, in charge of the Shreveport office, will move to Tulsa and his duties will be expanded. He will continue the technical meetings of the Ark-La-Tex area and will conduct them in other areas.

Recycling News

Unitized Pressure-Maintenance Project At Schuler Begins Operation

SHREVEPORT, La.—The Lion Oil Refining Co., operator of the unitized properties producing oil from the Jones sand, Schuler field, South Arkansas, announces that it will begin operation of the $400,000 gas recycling plant this week. The plant was completed and put on stream ahead of schedule.

All but six wells producing from the Jones sand were unitized last February, and the Lion company was named operator by the parties to the unitization. At that time all high-gas-oil-ratio wells were closed in and nearly all of the field allowable of 13,500 bbl. daily was produced from 40-50 of the low ratio wells. For the 4-month period prior to unitization the reservoir pressure dropped 210 lb., or 1.70 lb. per day. Due to the decrease in gas production through use of low-ratio wells, the pressure decline since unitization has been only 0.516 lb. per day, at the same oil-withdrawal rate. Beginning with gas injection, the daily pressure decline of the gas-drive reservoir will level off still further. It is estimated that 93 per cent of all gas produced will be returned to the reservoir. Of the total operating unit, 94 per cent of royalty owners have signed the unitization agreement. Those remaining to sign have not yet been approached, since they live at distant points from Schuler.

UNITED GAS DISPATCHERS MEET IN SHREVEPORT . . .

Dispatchers for United Gas Pipe Line Co. recently met at the home office in Shreveport, La., and posed for their picture. The men are, bottom row: Thomas Ed Ferguson, dispatcher, Monroe, La.; W. A. Johnson, district chief dispatcher, Monroe, La.; P. D. Elkins, Jr., district chief dispatcher, Houston, Tex.; James D. Carpenter, district chief dispatcher, Jackson, Miss.; Robert Elmer Wagner, district chief dispatcher, San Antonion, Tex. Middle row: O. C. Irvine, district chief dispatcher, New Orleans, Laa.; G. C. Irvine, dispatcher, Nederland, Tex.; R. O. Brandenburg, district chief dispatcher, Dallas, Tex. Top row: Charles E. Moore, district chief dispatcher, Iowa, La.; A. A. Spence, district chief dispatcher, Wichita Falls district; R. C. Appling, chief dispatcher and superintendent of telephone and telegraph department, Shreveport, La.; C. Edward Daniel, assistant chief dispatcher, Shreveport, La., and Thomas B. Kelley, day dispatcher, Shreveport La.

Natural Gasoline

Shell Enlarging Capacity Of Magnolia Gasoline Plant

SHREVEPORT, La.—Shell Oil Co., Inc., is enlarging its natural-gasoline plant in the Magnolia field of Columbia County, South Arkansas, to a total capacity of 20,000,000 cu. ft. of gas daily. Two 485-hp. compressors are being installed, and two additional boilers and one absorber are being added to the plant, as well as expanded absorption oil circulation facilities, and propane storage. The enlarged plant will care for all gas produced in the field, which production now averages 19,000,000 cu. ft. daily.

Further utilization of the residue gas from the natural-gasoline plant will be provided upon completion of a Girbotol treating plant being installed by Lion Oil Refining Co. The latter company will begin taking more Magnolia gas in July for use at its El Dorado refinery, and has contracted for an ultimate total of 15,000,000 cu. ft. daily. Compressors and lines to handle the gas to El Dorado are being installed.

PROGRAMS AND MEETINGS

Petroleum Accountants at Los Angeles Elect Dwight A. Moore

Dwight A. Moore, assistant secretary-treasurer and controller of the Wilshire Oil Co., Inc., was elected president of the Petroleum Accountants Society at a recent meeting of the society. Other officers elected for the ensuing year are: Irving J. Hancock, Union Oil Co. of California, first vice president; N. J. Allen, Lincoln Petroleum Co., second vice president; Charles V. Slack, General Petroleum Corp. of California, secretary-treasurer.

D. A. MOORE

Mr. Moore succeeds W. A Russell, Seaboard Oil Co. of Delaware, who was president of the society during the past 12 months. A. F. Hagen, Shell Oil Co., Inc., and John P. Vezzetti, Sunset Oil Co., were reelected to the society's board of directors. John F. Baumgaertner, Ohio Oil Co., was elected to fill a vacancy on the board.

Mr. Moore, the new president, is a certified public accountant, and holds degrees from the University of Southern California and Harvard University school of business administration. He is a member of the Controllers' Institute, and the State Society of Certified Public Accountants. He has been connected with the Wilshire Oil Co., Inc., since 1926.

A.G.A. Secretary Addresses Kentucky Oil Men

E. Holley Poe, secretary of the Natural Gas Section of the American Gas Association, was principal speaker at the meeting last week of the Kentucky Oil and Gas Association. Commenting on the ability of the natural-gas industry to do its full part in meeting the exacting requirements of the defense program, Mr. Poe said the nation's natural-gas reserves are conservatively estimated at 85 trillion cubic feet. He said there are in operation today 84,700 miles of natural-gas trunk lines, ready to deliver gas fuel to strategic points of the nation in aid of a peacetime defense program without greatly impairing service to normal markets. He also mentioned that the industry is preparing the way for amazing new uses of natural gas, many of which we will see in our time.

Geologists Change Date of Meeting To Avoid A.P.I. Conflict

The date of the fall meeting of the Pacific Section of the American Association of Petroleum Geologists has been changed to October 16 and 17. The original date was scheduled for November 6 and 7, but due to conflict with the A.P.I. meeting which will be held in San Francisco on November 3 to 7, the date of the geological meeting has been advanced.

The sessions will be held in the Ambassador Hotel, in Los Angeles, Calif.

American Chemical Society to Hold 102nd Meeting in Atlantic City

Seymour W. Ferris, chief chemist of the Atlantic Refining Co., has been appointed chairman of a general committee to direct arrangements for the 102nd meeting of the American Chemical Society, which, sponsored by the society's Philadelphia section, will be held at Atlantic City, N. J., September 8 to 12.

More than 5,000 chemists, chemical engineers, industrialists, educators, and representatives of allied fields including state and federal services will participate in the events, which will be keyed to the chemical industry's all-out effort to speed defense. The convention is expected to be one of the largest in the society's history.

Seventy-eight sessions, at which research in practically every sphere of pure and applied chemistry will be reported, are scheduled by the 18 divisions of the society. Seventeen special symposia will deal with a wide range of current scientific investigation. Fuels, food, petroleum, phosphates, rubber, medicinals, unit processes in industry, and biological problems related to national defense are among the subjects to be discussed.

Mr. Ferris joined the Atlantic Refining Co. as research chemist in 1923 and became chief chemist in 1936. He is 41 years old, a native of Hunter, N. Y., and was graduated from Cornell University in 1922.

An executive convention committee has been named as follows: Lyle L. Jenne, of the Philadelphia Bureau of Water; J. Bennett Hill, manager of the development division of the Sun Oil Co., Philadelphia; Newcomb K. Chaney, director of research of the United Gas Improvement Co., Philadelphia; Prof. H. J. M. Creighton, of Swarthmore College; Prof. Hiram S. Lukens, director of the department of chemistry and chemical engineering of the University of Pennsylvania, and William Stericker, development chemist of the Philadelphia Quartz Co.

Thousands of people were attracted to El Dorado, Ark., last week as the town celebrated the twentieth anniversary of the discovery oil well in Arkansas, 1 Busey-Armstrong, 1 mile west of the town. Shown here are Frank Smith, mayor of El Dorado during the boom, now fire chief; Judge W. E. Patterson, El Dorado attorney, one of the original unit holders in the Busey trust; Dr. Samuel T. Busey, the discoverer of oil in Arkansas, and Sidney Felsenthal, brother of the late Ike Felsenthal, who was active in early oil activities of the state

CALENDAR OF EVENTS

June

AMERICAN SOCIETY FOR TESTING MATERIALS, forty-fourth annual meeting, Palmer House, Chicago, June 23-27.

September

AMERICAN CHEMICAL SOCIETY, Atlantic City, N. J., September 8-12.

NATIONAL PETROLEUM ASSOCIATION, thirty-ninth annual meeting, Hotel Traymore, Atlantic City, N. J., September 17-19.

SOCIETY OF AUTOMOTIVE ENGINEERS, national tractor meeting, Schroeder Hotel, Milwaukee, Wis., September 25-26.

NATIONAL LUBRICATING GREASE INSTITUTE, ninth annual meeting, Stevens Hotel, Chicago, September 29-30.

October

WEST VIRGINIA OIL AND NATURAL GAS ASSOCIATION, annual convention, Clarksburg, W. Va., October 2-3.

NATIONAL FOREIGN TRADE CONVENTION, twenty-eighth meeting, Hotel Pennsylvania, New York City, October 6-8.

TEXAS MID-CONTINENT OIL AND GAS ASSOCIATION, twenty-second annual convention, Beaumont, Tex., October 9-11.

AMERICAN ASSOCIATION OF PETROLEUM GEOLOGISTS, Pacific section, Los Angeles, Calif., October 16-17.

AMERICAN INSTITUTE OF MINING AND METALLURGICAL ENGINEERS, Petroleum Division, Dallas, Tex., October 16-18.

INDEPENDENT PETROLEUM ASSOCIATION OF AMERICA, twelfth annual meeting, Tulsa, October 20-21-22.

AMERICAN INSTITUTE OF MINING AND METALLURGICAL ENGINEERS, Southern California Section, Los Angeles, Calif., October 30-31.

SOCIETY OF AUTOMOTIVE ENGINEERS, national aircraft production meeting, Biltmore Hotel, Los Angeles, Calif., October 30-November 1.

CALIFORNIA NATURAL GASOLINE ASSOCIATION, Los Angeles, Calif., October 31.

November

AMERICAN PETROLEUM INSTITUTE, twenty-second annual meeting, St. Francis and Palace Hotels, San Francisco, Calif., November 3-7.

December

EXPOSITION OF CHEMICAL INDUSTRIES, eighth annual meeting, Grand Central Palace, New York, December 1-6.

NEW MEXICO OIL AND GAS ASSOCIATION, Artesia, N. M., December 3.

AMERICAN INSTITUTE OF ELECTRICAL ENGINEERS, Southeastern district meeting, New Orleans, La., December 3-5.

OKLAHOMA STRIPPER WELL ASSOCIATION, Tulsa, December 5.

1942

February

TEXAS OIL AND GAS ASSOCIATION, Wichita Falls, Tex., February 28.

April

NATIONAL PETROLEUM ASSOCIATION, thirty-ninth semiannual meeting, Cleveland, Ohio, April 16-17, 1942.

August

MISSISSIPPI OIL EXPOSITION, Yazoo City, Miss., August 27-29.

Equipment used to control pressure in deep wells is generally located in a cellar but when the drilling machinery is mounted on a barge, the connections are located between decks. Blind rams are used for closing the well while the drill pipe is out of the hole and rams curved to fit the pipe are used for controlling the well when the drill pipe is in the hole. There are also lines for killing the well, and filling up the hole. The flow line is equipped with a valve although it is not shown in the picture. Control lines for operating the rams can be seen coming through the derrick floor

ENGINEERING & OPERATION

In This Section

JUNE 26, 1941

WEST LAKE VERRET FIELD OFFERS FEW PROBLEMS DESPITE DEPTH
By Neil Williams ..... Page 42

Depth at which oil production was obtained in the West Lake Verret field of coastal Louisiana was recently extended from sands at 7,400-8,900 ft. to a new sand at 11,493-11,522 ft., giving that field the distinction of being the deepest oil producer in the district. Drilling and completion of the deep producer involved no major problems other than normal hazards of deep drilling.

NEW OPELIKA RECYCLING PLANT PROVIDES FLEXIBLE OPERATION
By George Weber ..... Page 46

In the Opelika field of eastern Texas, Lone Star Gasoline Co. and Shamrock Oil & Gas Corp. have undertaken pressure maintenance on a field-wide basis. The project was placed in operation before reservoir pressure had declined appreciably, thereby reducing subsurface condensation and making possible a maximum recovery of liquid hydrocarbons.

INCREASED RECOVERY BY PRESSURE MAINTENANCE
By Jack H. Abernathy ..... Page 53

In pressure-maintenance operations, questions often arise as to increases in recoverable oil that may be expected from instituting such projects in a new pool, in a partially depleted pool, and in one where only a portion of the total gas is available for reinjection. Here the author presents a method for determining the approximate answers.

STEELS AND ALLOYS DEVELOPED FOR HIGH-TEMPERATURE REFINING
By B. B. Morton ..... Page 60

Steps which have been taken in the development of steels and alloys for use at elevated temperatures are outlined and various tests that have been used in this development are briefly discussed. A review is also given of the different alloying elements.

SAFETY: Company Organizes Own Force for Fighting Fires ..... Page 44

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West Lake Verret Field Offers Few Problems Despite Depth

By NEIL WILLIAMS

THE distinction of being the deepest oil-producing well on the Louisiana Gulf Coast is held by Shell Oil Co., Inc., and Cities Service 1-B Norman Breaux Lumber Co. in the West Lake Verret field, St. Martin Parish. This well, completed last April, has been flowing 30.3° A.P.I. gravity crude from a sand at 11,493-11,522 ft. with bottom of hole at 11,550 ft. Other wells in coastal Louisiana have been brought in from greater depths but their production either has been of the distillate-gas type or else has been short lived. The latter fact had led some operators to wonder whether important oil production could be expected in the district at such depths.

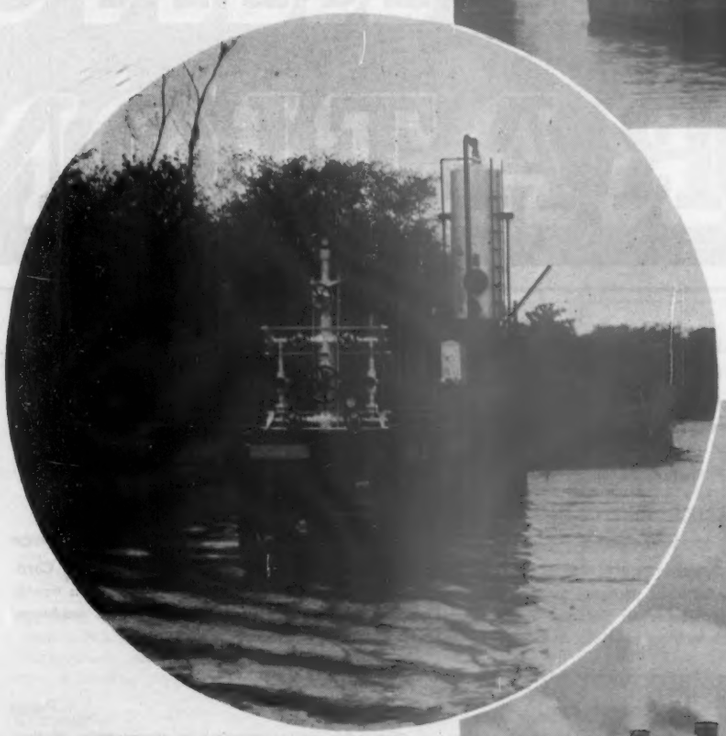
Lately several wells in other fields of the district also have shown for oil production in sands at these levels, and even at slightly greater depths, but so far the potentialities of these wells have not been established definitely. Chief among these wells is one Phillips Petroleum Co. has been testing in the Erath field, Vermilion Parish, and which flowed 39° gravity oil for a short time from a sand at 11,600 ft. The West Lake Verret well, however, has been producing steadily since completion with indications of prolonged, consistent potentialities.

Production at West Lake Verret previously had been found in sands ranging in depth from 7,400 ft. to 8,900 ft. Eight wells had been completed in these sands. In addition, there is a gas well, completed in a shallower sand, which was drilled to supply fuel for field operations. The deep producer is one of seven tests that have been drilled to greater depths in exploration of lower horizons, two of which were carried to depths below that of the deep producer. All wells except 1-B Norman Breaux are owned entirely by Shell Oil Co., Inc., which, since discovery of the field in 1938, has followed a conservative and systematic development program with three rigs now in regular operation.

Located in the heart of a densely wooded, swampland area of the Atchafalaya River basin about 15 miles north of Morgan City, the field is inaccessible except by water route out of the latter city and through canals and other water channels dredged through the field to the various locations. Except for the first test, for which piling foundations were constructed, development has been carried on with marine drilling units in true maritime style.

Drilling and completion of the deep producer involved no major problems or difficulties other than the normal hazards of deep drilling. Only

Centrally located mud-storage house, from which mud and weighting materials can be supplied quickly to any well in field in an emergency



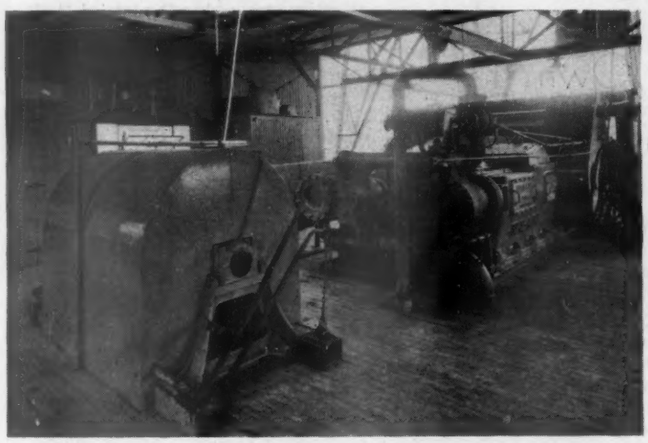
Above: Scene in West Lake Verret field, St. Martin Parish, coastal Louisiana. The well shown is one of the original wells in the field, and gives an idea of the conditions prevailing in the field

Right: Maritime drilling rig used by Shell Oil Co., Inc., in deep-development operations in the West Lake Verret field, St. Martin Parish, Louisiana Gulf Coast. The drilling barge is of the submersible type, while the boiler barge is of the floating type

two minor fishing jobs marred the record of the well, which was drilled and completed in an over-all time of only 52 days. Practices and precautions followed were in conformity with those customarily exercised by this company to insure adequate protection and minimize the hazards in all its deep-drilling operations.

From an operating standpoint, conditions in the West Lake Verret field generally have been unusually favorable. Porous formations and cavities that have caused loss of returns have been encountered at shallow levels in several wells. Also in one of the deep tests (4 Jeanerette), a salt water flow at 11,890 ft. forced quitting the hole at that depth and plugging back to one of the regular sands for completion, but otherwise drilling has been more or less uneventful. So far no excessive gas pressures have been encountered, although every precaution is taken to guard against any eventualities.

The deep well was drilled with a company rig, although two contract rigs, one owned by Loffland Brothers and the other by Cron & Gracey, are being operated in the field. Equipment and facilities of this rig were of sizes and general types prescribed as standard by this company for all its deep-drilling rigs.



The assembly includes four 125-hp. 300-lb.-working-pressure boilers, a 14 by 14-in. steam engine for the heavy-duty draw works, two 15½ by 8½ by 20-in. slush pumps in exclusive mud-circulatory service, an additional 18-in. pump for mud mixing and general utility, a 27½-in. rotary, a 136-ft. steel derrick with a 30-ft. base, a 300-ton open-bail hook, a 500-ton traveling block with six 48-in. sheaves, and a 600-ton crown block with seven 48-in. sheaves. Other units are of equivalent large size. The marine drilling unit proper is of the submersible type as generally used in maritime operations, but the separate boiler unit is of the floating type. The former has 10-ft. hulls 118 ft. long with an over-all width of 44 ft., while the boiler unit is 80 ft. long and 25 ft. wide with 6-ft. hulls.

16-In. Conductor Pipe Set

Drilling of the well was started with 22-in. hole for 16-in. conductor pipe, 90 ft. of which was set at 112 ft. and cemented with 125 sacks of cement. The discrepancy in length of this string and the depth is accounted for in the distance from the top of the pipe to the rotary table. This hole was drilled and the pipe cemented within the first day after moving barge on location. Cement was allowed to set 12 hours, after which hole was reduced to 15 in. and carried to 2,489 ft. for the surface pipe. This string, consisting of 2,464 ft. of 10¾-in., 40.5-lb. welded casing, was seated at 2,489 ft. and cemented with 400 sacks of cement, plug of which was down 2 days after drilling out the conductor pipe. Prior to running this string, an electrical-log survey was run from total depth of 2,489 ft. to the conductor pipe. Cement was allowed to set 24 hours.

For drilling below the surface casing, a blow-out-preventer assembly consisting of a 10¾-in. master valve on bottom, a 10¾-in. preventer with hydraulically operated rams and having 8⅝-in. outlets, and a pressure-control head on top was set up. The 10¾-in. plug then was drilled out with a 9⅞-in. two-way bit.

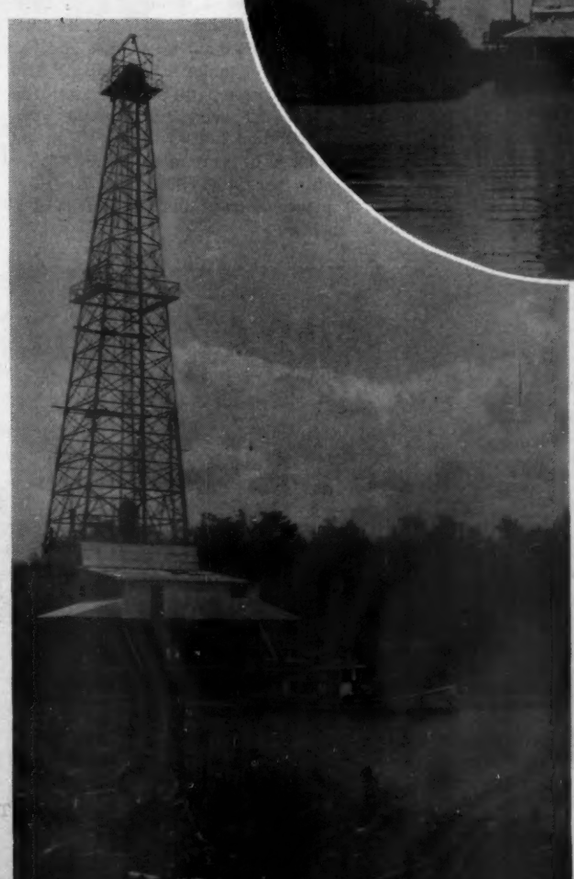
Open hole was drilled to the total depth of 11,550 ft., where, with sand showing oil at 11,493-11,522 ft., the 5½-in. completion casing was run. This hole totaled 9,065 ft., an unusual amount of open hole to be maintained. The hole was drilled with 9⅞-in. bits to 10,975 ft., where it then was reduced, the remaining 575 ft. being drilled with 8⅝-in. bits.

Drilling was done throughout with 4½-in. 18.1-lb. drill pipe with 4½-in. internal flush, external upset tool joints, and using 90 ft. of 6⅞-in. drill collar. Fifty bits were required for the entire hole. Of these, 12 were rock bits, used at short intervals between 6,000 ft. and 7,000 ft., and for most of the drilling below 10,000 ft. The others were two-way and three-way bits of fishtail type. Most of the drilling was comparatively easy with from 700 to 800 ft. of hole usually being made daily with as much as 1,800 ft. being made on one occasion.

Two Twistoffs Occur

First sign of possible trouble was when the hole was at a total depth of 8,606 ft. In coming out of the hole from that depth the pipe pulled 10 points through a groove at 3,046-42 ft. To remedy the trouble an underreamer was run and the hole underreamed from 9⅞ in. to 10¾ in. in diameter from 2,970 ft. to 3,230 ft., taking in the portion of the hole where the groove was found.

While drilling at 9,404 ft. the pipe twisted off at the pin in top of the drill collar, leaving 40 ft. of fish in the hole. A trip with an overshot to recover the fish did not succeed, and a taper tap was run, which was successful on the first trip. Less than a day was lost in this mishap but the hole had only been drilled to 9,500 ft., an additional 96 ft., when another twistoff occurred, leaving the drill collar sub and 48 ft. of fish in



Left, above: Engine floor of drilling barge operated by Shell Oil Co., Inc., showing heavy-duty draw works driven by a 14 by 14-in. steam engine. In foreground is reel used in wire-line coring

Above, and left: Towing drilling barge through canal to new location in West Lake Verret field. This is rig owned by Loffland Brothers and operated under contract for Shell Oil Co., Inc. The field is located in the heart of a densely wooded swamp-land area of the Atchafalaya River basin, and is inaccessible except by water route

the hole. This, however, was recovered with one run of an overshot, except for a piece of the 4½-in. drill pipe that had broken off in the hole. This was drilled out with a rock bit. Because of this trouble, during a 3-day period only 198 ft. of new hole was made.

Down to 10,802 ft. the blocks were strung with eight lines. There, because of the increasing load, 10 lines were strung to finish the hole. In drilling, about six points of weight ordinarily were carried on the indicator. Rotary speeds varied greatly, depending on how the hole was drilling. Speeds at times were as much as 200 r.p.m.

Coring was not started until the hole was at a depth of 10,923 ft., just above where the hole was reduced from 9⅞ in. to 8⅝ in. in diameter. Prior to this, dependence was placed entirely on electrical logging and sidewall cores for correlation and checking of formations. From that point to bottom the hole was cored practically all the way, with a total of 49 cores being taken, all except the first core at 10,923 ft. being in the 8⅝-in. hole. Coring was by means of wire-line core barrels exclusively.

Six electrical logging surveys were made below the surface casing. The first was made from 7,352 ft. up to the bottom of the casing; the second from 8,558 ft. up to 7,351 ft.; the third from 9,995 ft. up to 8,500 ft.; the fourth from 10,800 ft. up to 9,995 ft.; the fifth from 11,351 ft. up to 10,800 ft., and the sixth from the bottom of the hole at 11,550 ft. up to 11,351 ft.

Every effort was exerted to keep the hole as nearly vertical as possible. Deviation and directional surveys were made every 500 ft. in surface hole and below the surface hole at intervals of approximately 250 ft. Maximum deviation at any point was only 2° 45'.

Although no complicated mud-conditioning problems were involved, the treatment of mud constituted an important phase of operations. Close control was maintained at all times over the mud condition to keep it in shape to avoid possible trouble. This was contributory to the ability of the operators to maintain 9,065 ft. of open hole below the surface casing.

Native clays were used as a base for the mud. As occasion demanded treatment, quebracho was added for control of viscosity. At no time were any weighting materials required, as reflected in the comparatively light mud with which the hole was drilled. Hole was carried to around 11,000 ft. with only 10-lb. mud. Below that depth the weight was stepped up to between 10.3 lb. and 10.5 lb. At total depth preparatory to running casing, weight of the mud was conditioned to 10.4 lb.

The mud program called for keeping viscosity of the mud less than 30 and holding the water loss under 15 per cent. Water loss much of the time was substantially under that figure, and at times as low as 3 cc. Salt content usually ran from 400 to 500 p.p.m. of soluble chlorides, although at the end this content showed a tendency to increase. An analysis of the mud prior to running of casing showed a salt content of 690 p.p.m. Toward the last substantial quantities of quebracho and pyrophosphates were added daily to keep the mud in proper condition.

Casing Program

The production string of casing totaled 11,534.57 ft. of 5½-in. o.d. pipe which was cemented at 11,549 ft. with 528 sacks of cement. The string, from bottom up, was made up as follows:

	Length (ft.)
1 whirler-type float shoe	1.55
1 joint N80, 17-lb., 8-round-thread casing	41.57
1 float collar	1.43
40 joints N80 17-lb., 8-round-thread casing	1,677.17
56 joints N80 15-lb., 8-round-thread casing	2,290.47
91 joints J55 15-lb. casing (regular threads and collars)	3,819.22
36 joints J55 15-lb. casing (long threads and collars)	1,522.28
37 joints N80 15-lb., 8-round-thread casing	1,584.29
14 joints N80 17-lb., 8-round-thread casing	596.59
Total	11,534.57

Casing was started in the hole at 3 a.m., after drilling mud had been thoroughly conditioned. At 2:15 p.m., 11 hours and 15 minutes later, the same day, the plug was down. The last 150 sacks of cement of the the total of 528 sacks used in the job was squeezed. This was accomplished by closing the casing outlets when it was calculated by the mud displacement that all except the 150 sacks of cement was behind the casing, and allowing the pressure to build up. Maximum and final pressure built up in the casing was 2,100 lb. Average weight of the cement slurry pumped was 16 lb.

A period of 48 hours was allowed for setting of cement, during which time the 4½-in. drill pipe was laid down. As the top of the cement was below the point to be perforated in the casing, it was not necessary to drill out cement preparatory to perforating. A gun perforator then was run, and the casing perforated at 11,490-97 ft. with 29 ½-in. shots. Two-inch tubing was then hung at 11,325 ft. No screen or liner was set. Removing the blowout preventer, christmas tree was set up and flow lines connected. Washing of the hole with clear water to clean out the mud was started at 10:35 a.m. April 9. The well started to "kick" at 12:05 o'clock noon; at 5 o'clock that afternoon the first show of gas was noticed, and at 5:25 o'clock the first trace of oil was seen. By 9 o'clock that evening the well had cleaned sufficiently for the oil to be turned into an oil barge which had been tied up at the well to transport the oil, and from that time until 1 o'clock the next morning the well flowed at the rate of 12.2 bbl. an hour through a ⅛-in. positive choke.

Later, on official completion potential test, the well flowed at the rate of 363 bbl. of pipe-line oil daily through a ⅛-in. choke. Gas-oil ratio was 784 to 1. Gravity of the oil is 30.3° A.P.I., although the low gravity is partly attributed to the high paraffin content of the crude.

SAFETY - Company Organizes Own Force for Fighting Fires

IN the Pennsylvania oil fields where bulk of the leases are in woodlands and where wooden power houses, tanks and other equipment present a constant fire hazard, Brundred Oil Corp. of Oil City, Pa., has set up its own fire-fighting force in cooperation with the state. By so doing it has materially reduced fire losses on its own and adjoining properties. The company owns about 5,000 acres of leases in five districts surrounding Oil City, some of them 15 miles apart, and 90 per cent of which are located in woodlands.

In keeping with the policy of fighting its own fires, Brundred recently placed in operation the truck shown here, which is equipped with all types of equipment to meet all kinds of fires. It also has available two pickup trucks for rushing men and equipment to the scene of the fire. The truck was a passenger auto which was rebuilt for the new purpose intended. A small but powerful water pump was placed alongside the motor, and provision made for either pumping from a booster tank or directly from any available stream.

The truck equipment includes 300 ft. of 1-in. high-pressure hose, a cylinder of carbon dioxide, a number of foamite tanks, and especially designed rakes, axes and spray tanks that can be strapped to the backs of the fire fighters. Some of the equipment was furnished by the state; the remainder by the company. Changes to the truck and new equipment cost the firm about $800.

A 2-in. water line was recently extended by the firm from the city lines, a distance of ⅛ mile. Two fire hydrants are being placed on the line, one near the company's main warehouse and the other near a battery of tanks. The company also recently took another step to reduce costs; the replacing of convential wood and tar-paper power houses with all-steel houses. As a result insurance rates have been reduced from $3 per $100 to 75 cents per $100. Since the company operates 43 power houses this amounted to a substantial savings.

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The GIRBOTOL PROCESS *is* the right means. It removes H_2S 100%—and does it *at much lower cost* than any other method. At no obligation to you, we'll be glad to send you complete facts and proof, or to discuss and advise with you on your own particular problems. It will pay you to investigate—NOW!

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The GIRBOTOL process is a simple, continuous process for the separation and recovery of acidic gases, such as H_2S and CO_2 from mixtures. In cycle and equipment the process is similar to gasoline absorption. The process is protected by U. S. and foreign patents owned by The Girdler Corporation.

Processing section of the 80,000,000-cu. ft. recycling plant at Opelika, Tex. Left to right, the vessels are high-pressure residue gas scrubber, high-pressure absorber, high-pressure gas separator, low-pressure absorber, low-pressure residue gas scrubber, high-pressure vent tank, stabilizer tower, low-pressure vent tank and still.

New Opelika Recycling Plant Provides Flexible Operation

By GEORGE WEBER

Lone Star Gasoline Co. and Shamrock Oil & Gas Corp. recently completed a recycling plant in the Opelika field of eastern Texas with pressure-maintenance operations being carried out on a field-wide basis. The project was placed in operation before reservoir pressure had declined appreciably, thereby reducing subsurface condensation and making possible a maximum recovery of liquid hydrocarbons.

A RECENTLY completed recycling plant provides flexible field-wide operation in the Opelika field of Henderson County, East Texas. The project is owned jointly by the Shamrock Oil & Gas Corp. and the Lone Star Gasoline Co., and is operated by the former company.

The plant has a rated gas throughput capacity of 80,000,000 cu. ft. daily, handled in separate high and low-pressure absorption units. Present plant production consists of about 4,200 bbl. daily of a debutanized condensate, which is purchased by the Gulf Refining Co. and moved by pipe line from the plant to refineries in Ohio and Pennsylvania.

The recycling operation at Opelika combines the advantages of exclusive pressure maintenance in the entire field, and early operation, begun before reservoir pressure has declined appreciably. The first condition allows operators to carry out an efficient field injection program without competition from other similar projects. By providing pressure maintenance early in the field's production history, subsurface condensation is minimized and a maximum recovery of liquid hydrocarbons will result.

Opelika operations will be of particular interest to recycling engineers. Since the plan incorporates an entire field, the study of residue gas migration from the injection point will contribute to information on subsurface gas displacement during recycling. The project is the first major operation of its type in a lime reservoir, and as such it will furnish important data on recycling to porous lime.

Plant operations will interest processing engineers who are studying high-pressure absorption. The plant provides flexibility of operation, and experimental runs have already been run between 1,750 and 1,900 lb. per sq. in.

Field Development

The Opelika field was discovered by Tide Water Associated Oil Co., Seaboard Oil Co. and Humble Oil & Refining Co. in a joint well, No. 1 McElreath & Suggett. The discovery well produced oil at 7,200 ft. from what is believed to be a lime crevice, limited in extent and production. A second, southeast offset test drilled by the same operators missed the oil section and went deeper to open the first gas production from the lower Glen Rose formation at 8,000-8,200 ft.

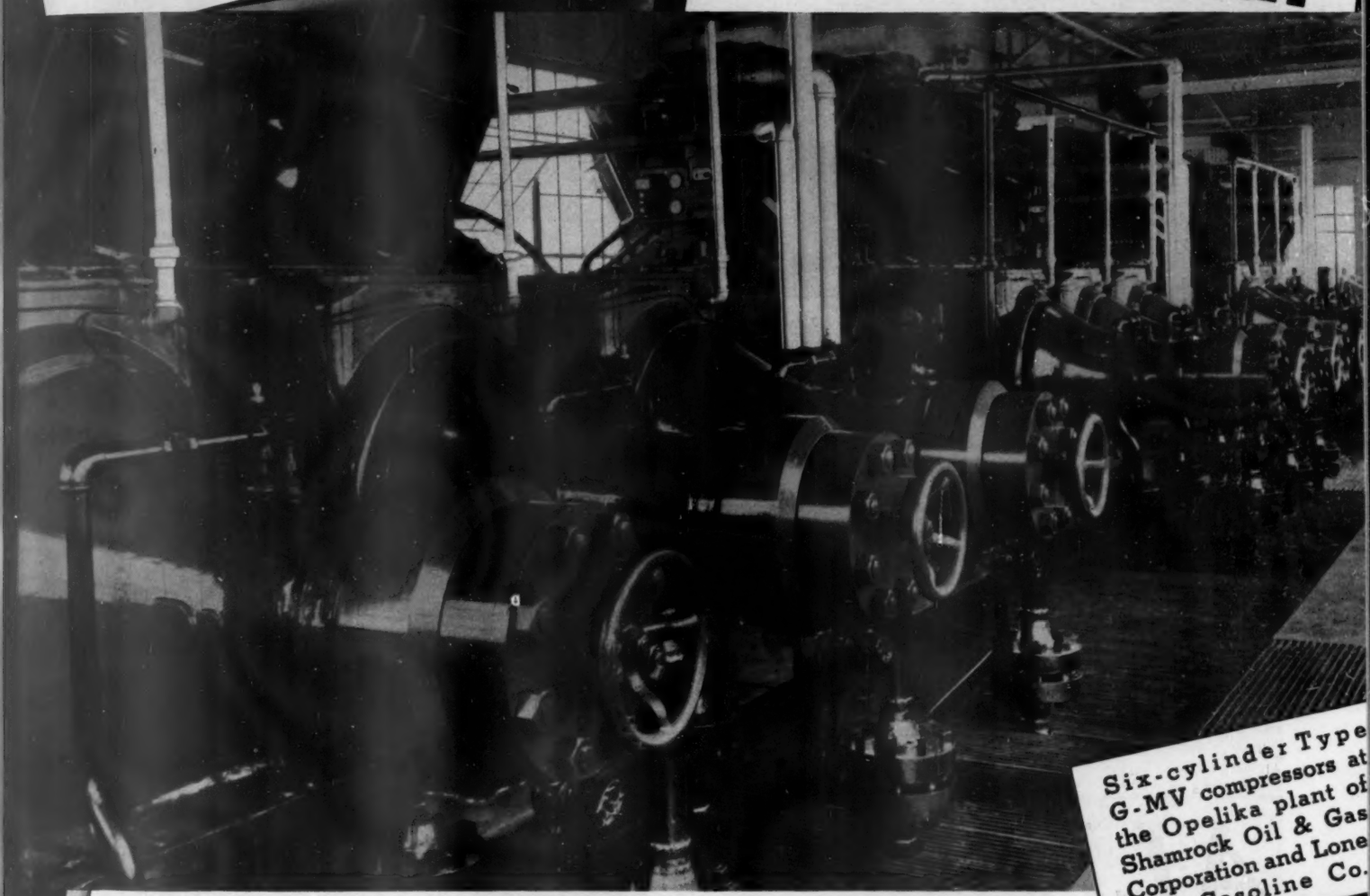
The Shamrock Oil & Gas Corp. and Lone Star Gasoline Co. became interested in the recycling possibilities of the field and on January 1, 1940, purchased the producing properties and assembled a block approaching 8,500 acres in extent. Including the gas-discovery well and those drilled later, the present field system comprises seven producing wells, one injection well and an eighth prospective producer, now drilling. Under the present operating agreement, the Lone Star Gasoline Co. drills the wells and the Shamrock Oil & Gas Corp. operates them in conjunction with the plant.

As currently developed, the field lies northwest of a major northeast-southwest fault. The recycling plant and injection well are located at the top of the faulted anticlinal structure. Extent of the producing acreage is not yet known, since it is definitely defined only by a north outpost failure. The acreage held by the operators is reasonably assumed to include nearly all of the prospective field area.

High-pressure gas production is found in two porous lime sections, proven continuous over the area thus far developed. The main porosity, ranging from 20 to 40 ft. in thickness, is overlain by a smaller 10-ft. porous streak and the two pay sections are separated by a 40 to 60-ft. interval of tight lime. The permeability of the producing sections shows a tendency to decrease down structure. This is illustrated by the flow capacities of various wells. The injection well, the highest well in the field, showed a natural open-flow capacity of 44,000,000 cu. ft. per day, while that of a present north-edge well is only 8,000,000 to 10,000,000 cu. ft. daily. Natural open-flow capacities are substantially increased by acidizing.

All wells drilled to date have 7-in. casing set through the producing horizons. Casing is perforated with 5 shots per foot of section using the larger ½-in. bullets instead of the regular .45-caliber shot. General practice calls for the use of 1,000 gal. of mud acid, followed by cleaning

Battery for Today's Job— G-MV's at Opelika!



Six-cylinder Type G-MV compressors at the Opelika plant of Shamrock Oil & Gas Corporation and Lone Star Gasoline Co.

And what a battery! . . . 600-horsepower Type G-MV compressors, with Cooper-Bessemer single-acting, high-pressure compressor cylinders . . . injecting sixty-million cubic feet of gas back into the formation daily, at discharge pressures well above the 4,000 psi mark. Here, again, compact and powerful Type G-MV's have been chosen for repressuring operations. Again, Cooper-Bessemer forged-steel, single-acting compressor cylinders (designed for 6,000-pound working pressures) have been selected for their remarkable simplicity, high efficiency, and construction features which permit adjustment of clearance for varying pressure conditions.

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and acidizing with 4,000 gal. of regular acid.

The reservoir pressure of the lime is at present 3,900-3,935 lb. per sq. in., believed to represent approximately the original pressure. None of the wells drilled to date has encountered water in either the upper or lower porous sections, and the presence of an active water drive, although considered a good possibility in such a field, is not yet proven. The production history of the field is too short to have indicated such a drive from pressure-production relationship.

A field-testing unit is employed in yield tests on every well in the field once each month. Sampling tubes are installed in the vertical loops on all Christmas trees. The mobile testing unit connects to the sampling tube at the well and a separator and charcoal test is made of a representative sample of the well stream. This method of field testing will be used throughout the recycling operation to provide a check on well performance and to indicate progress of the injected gas front.

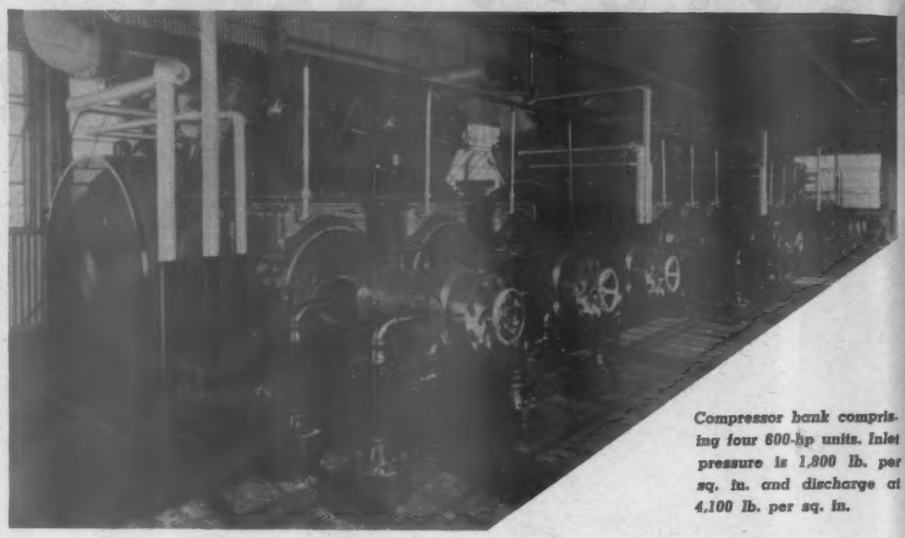
Operating Schedule

Current recycling-plant operation results in a total daily production of 75,000,000 to 80,000,000 cu. ft. of gas. Shrinkage due to processing and plant use and outside gas sales result in a net withdrawal of 20,000,000 to 22,000,000 cu. ft. daily. The current withdrawal rate as compared with known reserves of high-pressure gas indicates a long-term plant operation.

A relatively high yield of condensate promises ample return on plant and field investment. In addition, the advantage of early pressure maintenance guarantees maximum recovery of condensate. Field development for recycling under a unitized program requires far fewer wells than under ordinary well-spacing programs.

Without recycling it is improbable that the field would justify full development for several years, due to the lack of gas demand in East Texas. Therefore incorporation of the field into a single recycling program has resulted in greater returns to operators, royalty owners and tax recipients at a much shorter payout period.

The recycling plant operates at two pressures. About 20,000,000 cu. ft. of the daily intake of 80,000,000 cu. ft. is flashed to a low pressure, and the residue gas is sold to the Lone Star Gas Co. The remaining 60,000,000 cu. ft. is held at high pressure through the absorption process and recompressed for injection.



Compressor bank comprising four 600-hp units. Inlet pressure is 1,800 lb. per sq. in. and discharge at 4,100 lb. per sq. in.

High-pressure gas from the seven producing gas is gathered in a 7-mile field system which converges at the plant in three main lines. At the plant-inlet header the gas averages 140° F. and 2,300-2,500 lb. per sq. in. From the header a 4-in. takeoff diverts part of the gas stream through a steam heater consisting of a 10-in. jacket, where the temperature is raised to 175° F. This higher temperature is necessary to prevent hydrate formation when the gas is flashed through an adjustable choke from 2,500 to 400 lb. per sq. in. The pressure reduction causes a temperature drop to 70° F.

The low-pressure gas passes to the low-pressure absorber where it is contacted with oil, scrubbed to remove any carry-over, and discharged to the Lone Star Gas Co.'s 12-in. line to Trinidad.

The main high-pressure gas stream passes from the inlet header through two 6-in. high-pressure gas coolers located in the base of the atmospheric cooling tower, and is charged to the high-pressure separator at the pressure desired for suction to the compressors. At present the pressure is 1,800 lb. per sq. in., and the temperature of the gas to the separator averages 110° F. After preliminary separation of condensate from the gas due to pressure reduction, the remaining condensate fraction is stripped from the gas in the high-pressure absorber.

Residue gas overhead from the absorber is scrubbed to prevent carry-over of liquid to the compressors, and passes to the compressor suction manifold. Four 600-hp. units compress the gas from 1,800 to 4,100 lb. per sq. in. and discharge to the injection line. Due to a pressure drop of 100 lb. per sq. in. in the injection line and check valve, actual input pressure at the top of the injection well is 4,000 lb. per sq. in.

Rich oil from the base of the high-pressure absorber is combined with the raw condensate from the high-pressure separator, and the total stream is flashed to the low-pressure absorber. With the added rich oil from the low-pressure absorber, it is withdrawn from the base of that column at 400 lb. per sq. in. and flashed to a high-pressure vent tank, held at 160-165 lb. per sq. in. The liquid undergoes a second pressure reduction in the low-pressure vent tank, operating at 60-65 lb. per sq. in. Vapor from both vent tanks is utilized as compressor fuel, with excess going to boilers.

After the two-stage pressure reduction, the liquid from the low-pressure vent tank is passed through a bank of heat exchangers where it picks up heat from the lean-oil still bottoms, and is charged to the still at 360° F. There the oil is stripped of lighter fractions and is withdrawn, cooled and run to the lean-oil surge tank.

The overhead vapor is condensed and that fraction not refluxed is run to the raw-make tank. Final finishing of the product takes place in the stabilizer which is operated as a debutanizer column. The debutanized bottoms are withdrawn from the stabilizer, cooled and run to storage. Light fractions from the raw-make tank and stabilizer reflux accumulator are used as plant fuel.

A heavy 43-44-gravity fraction brought in with the rich gas is separated in the still with the absorption oil and a portion of it is run to storage and mixed with the lighter debutanized product. The plant production averages above 80 per cent stabilizer bottoms and 20 per cent still bottoms.

Plant storage consists of three 5,000-bbl. tanks, three 10,000-bbl. tanks and six 50,000-gal. horizon-

(Continued on Page 56)

ALL
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WRITE FOR LITERATURE
Recently completed in the Opelika Field, Henderson County, in East Texas is a new, modern recycling plant owned by the Shamrock Oil and Gas Corp. and the Lone Star Gasoline Co. All of the steel buildings were furnished by Allied.
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WELL LOGS and FIELD DATA . . . . of Active Oil Areas

North Texas

(Compiled by The Oil and Gas Journal)

LOCATION: The area under consideration consists of Wichita, Archer, Clay and Montague counties and surrounding areas.

COMMUNICATIONS: Railroads and highways radiate out through the region from Wichita Falls which is the chief town in the area and an oil center of many years standing.

DEVELOPMENT: North Texas has undergone development for more than 20 years, beginning with the Burkburnett, Electra, and other shallow pools. Early development was largely limited to the shallow pays in the Cisco formation of upper Pennsylvanian age and many wells are still drilled to these shallow pays.

During the late 20's production extended out from this area into Wilbarger County and Cooke and Montague counties to the east. Many small fields were discovered, but nothing of major importance. Transportation facilities were not good and development lagged. At the end of 1932, out of more than 10,000 producing wells in the area, only 6 in Archer County were flowing. During that year 358 oil wells were completed, 490 dry holes were drilled and 520 producers were abandoned.

In 1933, two developments gave rise to some optimism regarding the area, namely, the discovery of commercial production from the Gunsight lime near Archer City and production from lime of Canyon age in the Johnson pool of Foard County. In 1934, Bend lime production was opened up in the Anarene pool in Archer County and a show, although not of commercial importance, was found in the Ellenburger east of Vernon in Wilbarger County. In the Archer City pool, 600 wells were completed.

Production was carried a little deeper in Archer County in 1935 when a lower Canyon sand was found productive, and in 1936 the only highlights were in the vicinity of Gainesville, in Cooke County, and near Nocona in Montague County, where production was developed in sands of Canyon or Strawn age. Deeper production was also found in the Rock Crossing pool of Wilbarger County in 1937, but the event of outstanding importance was the deep sand development in the K.M.A. field in Wichita and Archer counties.

The discovery well in the deep K.M.A. lime and sand pay was completed in 1931 for 140 bbl. but it attracted little attention and up to the end of 1936, only 11 wells had been completed in the pay which is of Strawn age. During 1937, however, 91 wells were drilled to the pay and it was estimated that 20,000 acres would prove productive. The production of the field had dropped to about 100,000 bbl. in 1936 and rose to 850,000 bbl. in 1937 and 4,800,000 bbl. in 1938. Discovery of this new deep producing formation, which was generally thought nonproductive, was responsible for the revival of activity in the area which has continued to the present time.

In 1938, the K.M.A. deep sand was greatly extended and embraced some 70,000 acres at the end of the year with 878 wells drilled. The Hull-Silk pool was also discovered during 1938 and three pays proven up of which two are in the Strawn and one in the Bend lime. The rich Walnut Bend pool in Cooke County was also discovered during that year by a 2,000-bbl. well in the Bend, and in Wichita County production was obtained in the Canyon in the Holliday pool. Other pools were discovered of which the Rogers & Rogers in Nocona County and the Voth pool in Cooke County were the most interesting. The former produced from the Canyon and the latter from the Ellenburger.

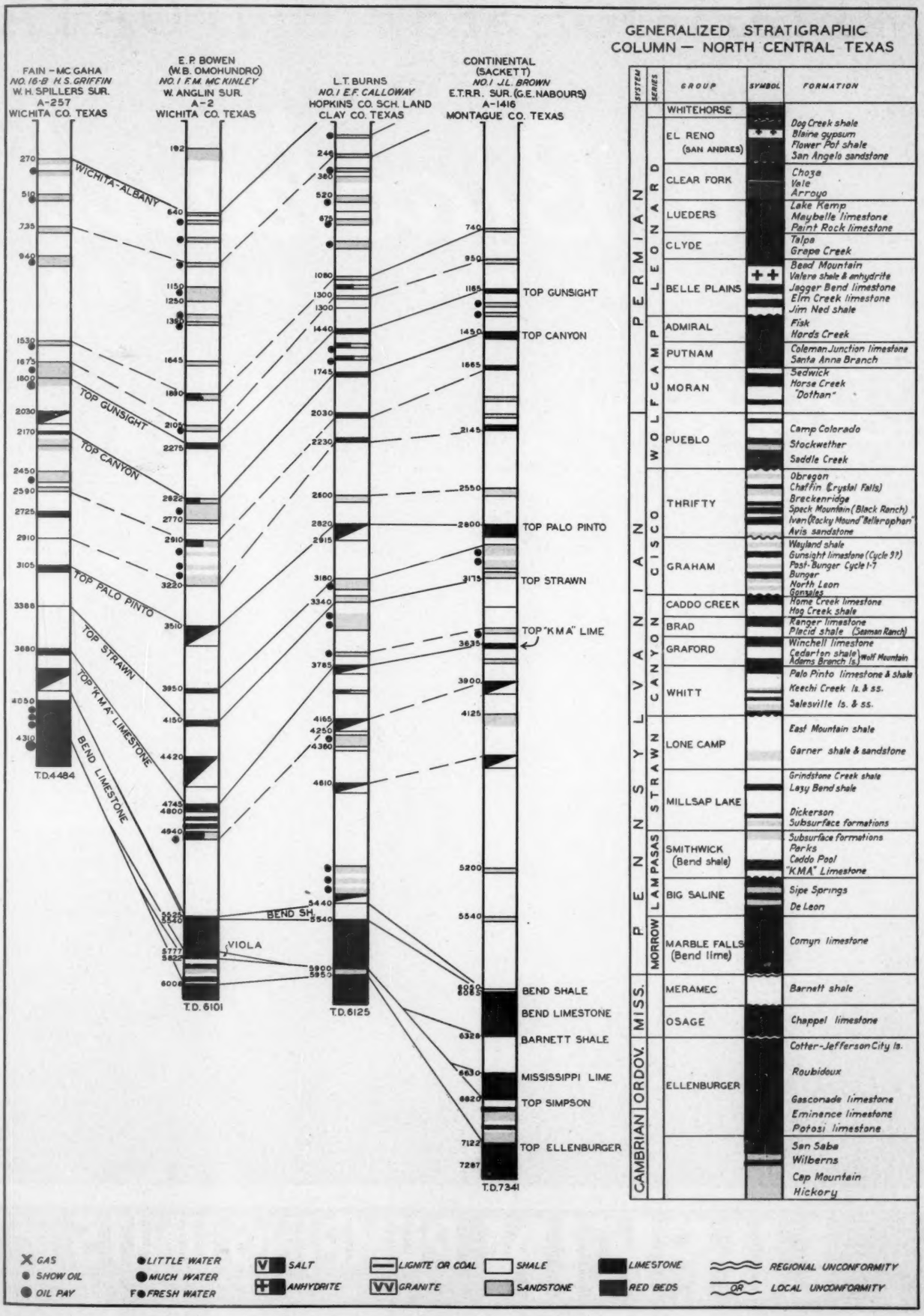
Thirty-one discoveries were recorded in 1939, of which many were deeper sands in known pools. Of these, four pools, two in Archer and one each in Wilbarger and Clay counties, were in the Cisco. Canyon sand was found at Seymour, Baylor County; Strawn in Jack, Archer, Montague, Clay, Wilbarger, Young and Cooke counties; Bend in Young, Archer, Jack, Clay and Montague counties, and Ellenburger in the Walnut Bend pool in Cooke County. In 1940, the record of discoveries, both of new pools and deeper sands, was continued with the Strawn and Bend pays providing most of the 32 finds.

Possibly the most significant discoveries during the past year were the finding of Ellenburger production in K.M.A. and the opening of the Mississippi lime play from Young County northward. The Hull-Silk pool is now producing from 10 distinct sands and production for the area as a whole has doubled since 1936.

During the last half of 1940 and the early part of 1941, the Fort Worth basin play developed into a major wildcat campaign. This activity, which extended almost to the city limits of Fort Worth, was an attempt to extend production far off the high along the Bend arch. It was largely unsuccessful, except for the opening of minor pools in southern Clay and Montague counties.

GEOLOGY: The major structural features of the region are the Bend arch, which runs northward from the Central Mineral region, and a series of folds associated with the formation of the Wichita Mountains of Oklahoma. The earliest structure was the Concho arch which extended to the northwest from the Llano uplift and was gradually depressed by the westward tilt of the basin from Canyon time on.

The northern structures began in the Mississippian and consist of a number of arches including the east-west Electra arch, the Muenster arch, which runs northwest-southeast, and other folds and flexures parallel to these. The whole area was submerged during late Pennsylvanian and Permian times along with minor movements associated with the Arbuckle uplift.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CANYON
CADDO CREEK
Home Creek limestone
Hog Creek shale
BRAD
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Cedarton shale
Adams Branch ls.
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WHITT
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LONE CAMP
East Mountain shale
Garner shale & sandstone
MILLSAP LAKE
Grindstone Creek shale
Lazy Bend shale
Dickerson
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MARBLE FALLS (Bend lime)
Comyn limestone
MORROW
BIG SALINE
Sipe Springs
De Leon
LAMPASAS
SMITHWICK (Bend shale)
Subsurface formations
Parks
Caddo Pool
"K.M.A." Limestone
MISS.
MERAMEC
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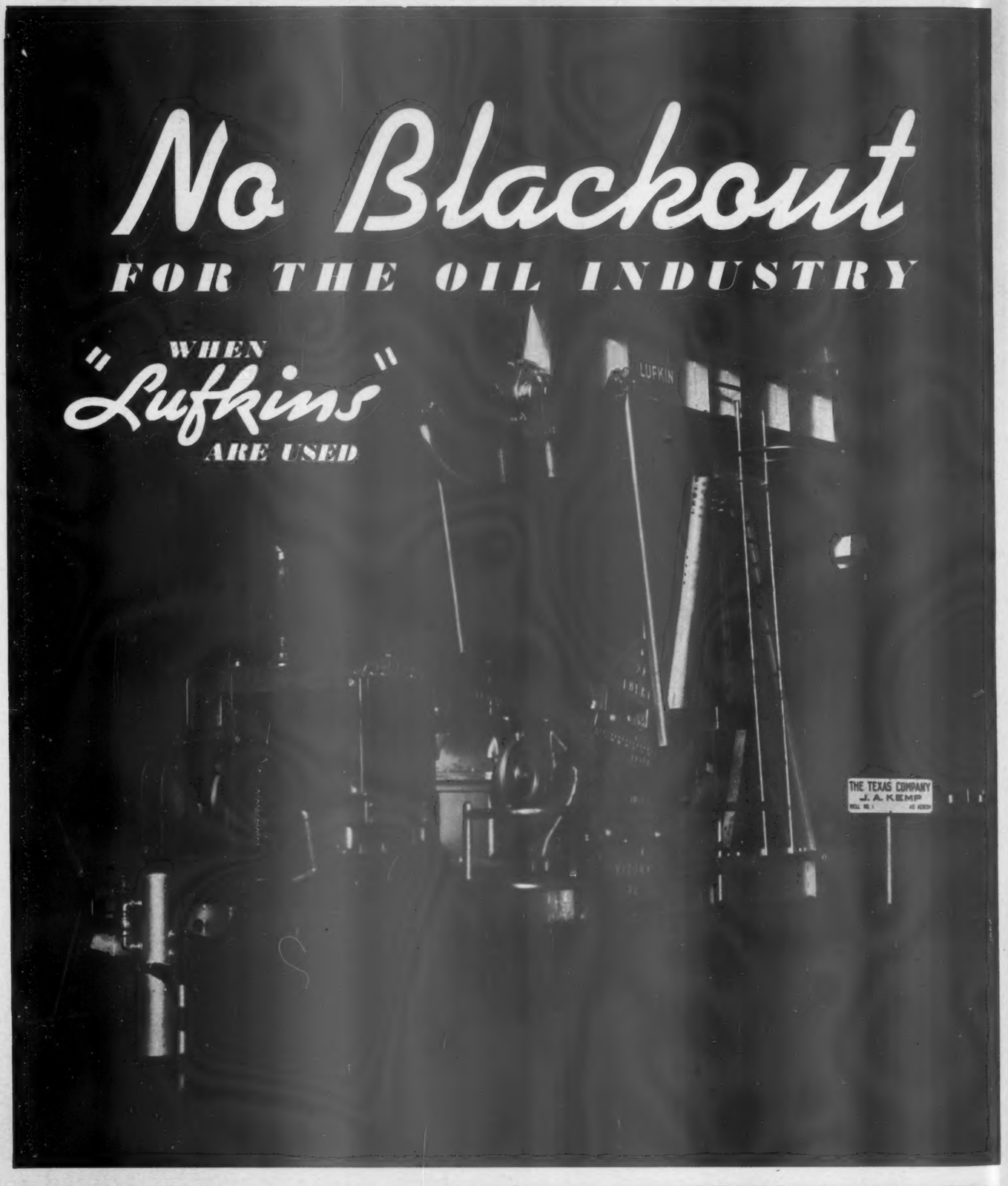

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Increased Recovery By Pressure Maintenance

By JACK H. ABERNATHY
Petroleum Engineer, Superior Oil Corp., Tulsa

Jack H. Abernathy is a native of Oklahoma and a graduate of the University of Oklahoma where he obtained his B.S. degree in petroleum engineering, January 1933. During his summer vacations while attending the university, he was employed by the Indian Territory Illuminating Oil Co. as a roustabout. After his graduation he was connected with the development department of the Sinclair Refining Co. in its East Chicago, Ind., offices. February 1, 1935, he joined the Sunray Oil Co. in Tulsa, as chief petroleum engineer and continued with that company until June 1, 1941, from which position he resigned to become the petroleum engineer for the Superior Oil Corp., Tulsa.

MANY articles are currently published which deal with the various types of recovery operations characterized by the injection of gas and/or air into a reservoir in order to increase the recovery of oil. These operations fall into two main groups, i.e., pressure maintenance and repressuring. These names are largely self-explanatory, pressure maintenance being injection at high pressures of all produced gas practicable, in order to maintain bottom-hole pressures, while repressuring is the injection at comparatively low pressure of gas and/or air after the reservoir has reached a stage of substantial depletion by ordinary production methods.

Despite the large amount of data in the literature, there is little information which gives the oil-company executive a direct idea of the quantity of oil, expressed in barrels or in per cent of the normally expected recovery, which can be added by pressure maintenance. It is not a requisite that such information be exact to the last decimal place, because the estimate of additional recovery by pressure maintenance is not required to be more exact than the estimate of recovery by primary means.

The writer's purpose is to present a method for determining approximately, at least, the answers to the following questions:

1. How much will pressure maintenance add to the reserves of a new pool?
2. How many barrels can be added by initiating pressure maintenance in a partially depleted reservoir?
3. How many barrels can be added by pressure maintenance, if only a portion of total gas is available for reinjection?

A brief discussion of certain factors which may affect the validity of the calculation is also undertaken.

Advantages of Pressure Maintenance

The following advantages of pressure maintenance are well known:

1. Gas is retained in solution which keeps the viscosity and surface tension of the oil at a minimum. By retaining these values at their original minimum figure, the smallest pressure differential is needed to cause the production of the oil; consequently reservoir energy is conserved. In volumetric (gas-control) reservoirs, this energy is in the form of gas, and gas-oil ratios are therefore reduced.
2. Premature encroachment of bottom-hole and edge water is lessened, minimizing bypassing and trapping of oil in the reservoir.
3. Lifting costs are lowered owing to prolonged flowing life and/or more efficient pumping. Higher back pressures can be carried on the wells reducing paraffin deposition and sand troubles.
4. Gasoline-plant life is lengthened and return is greater.

Among other advantages of pressure maintenance is a corollary to (1) above, in that void space resulting from the production of a barrel of oil is materially reduced. The significance of this item is not generally recognized.

Leverett and Lewis, in a paper presented to the American Institute of Mining and Metallurgical Engineers in New York in February 1940, state in part:

"In oil production by gas drive . . . excessively high gas-oil ratios usually are encountered by the time the gas saturation has reached about 25 per cent. Since continued production at high ratios quickly exhausts the available gas, it is usually predicted that in gas-expansion production the oil recovery corrected for shrinkage will be about 25 per cent or less of the reservoir-pore volume . . ." This statement (supported by ample data) shows that void space is the controlling factor in depletion by normal means, whether the recovery is 25 per cent or some other figure.

In the production of oil and gas from a volumetric reservoir, void space or reduced saturation occurs in two ways: (1) By the void left owing to actual withdrawals of reservoir fluids, and (2) by the shrinkage of oil in place owing to the lowering of reservoir pressures and consequent liberation of gas, which leaves denuded oil in the reservoir. In many cases this shrinkage of unproduced oil is nearly as important in reducing saturations as is the actual production of oil and gas.

A simplified calculation showing the effect on total recovery if this shrinkage is eliminated follows. The calculation is illustrative only, and reference to any particular field is purposely avoided. The following assumptions are made to avoid unnecessary complexity:

1. The reservoir has no effective water drive.
2. There is no free gas.
3. The oil is saturated with gas at the original reservoir temperature and pressure.

In order to use actual data in so far as possible, an approximate average of the shrinkage-solubility relationships for the oil and gas produced in several of the Permian lime pools in West Texas, is used as a basis for the calculation. It is emphasized that any other shrinkage curve might have been used in the example. The oil from an average 4,000-ft. Permian lime pool has about 750 cu. ft. of gas per barrel of residual oil in solution at original reservoir conditions and a shrinkage factor of about 1.35, which means that each barrel of oil in the tanks occupied 1.35 bbl. of space in the reservoir under the original conditions.

If we consider a reservoir that contains 40,000,000 bbl. of oil at reservoir conditions, then from the data of Leverett and Lewis, it might be expected that the production from this reservoir as measured in the tanks under normal conditions will be about

$$\frac{40{,}000{,}000 \times .25}{1.35} = 7{,}400{,}000 \text{ bbl.}$$

and the total reservoir space voided by production of oil is

$$40{,}000{,}000 \times .25 = 10{,}000{,}000 \text{ bbl.}$$

Since the pay was saturated originally the bal-

(Continued on Page 56)

SUMMARY

1. Laboratory data and field operations indicate that the average recovery from a gas-drive reservoir by conventional production methods is in the order of 25 per cent of oil in place (corrected for shrinkage).

2. The balance of the oil is left in the reservoir largely because at about 25 per cent void space the relative permeability of the formation to gas becomes high. Gas-oil ratios go up; the gas is exhausted and the field is considered depleted, although usually the pay retains a quantity of oil substantially in excess of that required to wet the reservoir rock, which is true depletion saturation.

3. Since void space is the controlling factor determining apparent depletion, any operation which reduces the quantity of void left by the production of a barrel of oil adds proportionately to the producible reserves. This is true though the recovery factor may be other than 25 per cent.

4. A sample calculation is presented indicating the magnitude of the void space "saved" by pressure maintenance. For a hypothetical 4,000-ft. Permian lime reservoir assuming no free gas, indicated additional recovery by complete pressure maintenance is about 78 per cent of recovery by primary means. It is shown that no part of this 78 per cent can be produced by repressuring.

5. Further calculations have been made and are presented graphically, showing the additional recovery by pressure maintenance for recovery factors varying from 20 to 40 per cent of oil in place.

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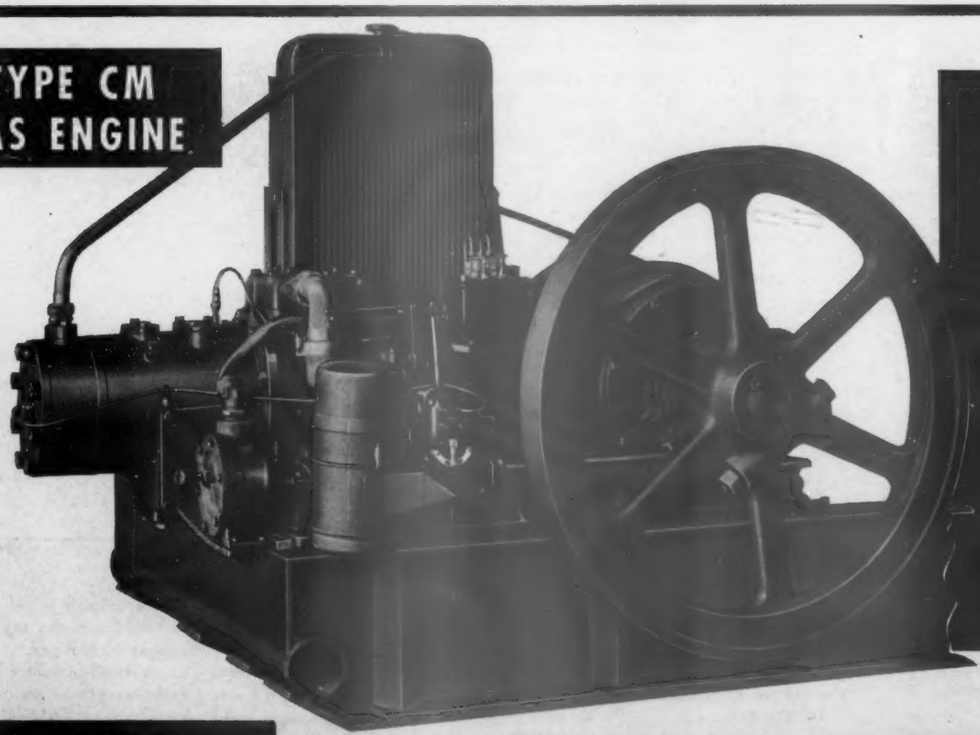

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ance, 30,000,000 bbl. of the reservoir space should be still. However, in producing 7,400,000 bbl. the bottom-hole pressure is reduced to substantially atmospheric pressure and the entire volume of unrecovered oil yields its solution gas, shrinking in place to the residual value. Reservoir volume occupied by this unrecovered oil is:

$$\frac{40{,}000{,}000 \times .75}{1.35} = 22{,}200{,}000 \text{ bbl.}$$

Space voided by shrinkage is 30,000,000 — 22,200,000 = 7,800,000 bbl. Total space voided under natural means of production is the space voided by withdrawals plus space voided by shrinkage of unproduced oil, or

$$10{,}000{,}000 + 7{,}800{,}000 = 17{,}800{,}000 \text{ bbl.}$$

Under complete pressure maintenance, total space voided would have been but 10,000,000 bbl. Then an additional quantity of oil sufficient to occupy 7,800,000 bbl. of reservoir space could be produced, before the void space and relative saturation would be equivalent to that caused by production to depletion under normal conditions. Correcting for shrinkage, this is an additional recovery of 5,570,000 bbl. (78 per cent) owing solely to pressure maintenance.

No portion of the 78 per cent additional recovery can be obtained by repressuring because at the time the extra oil has been produced the reservoir saturation is still as high as if substantial depletion by normal means had taken place, at which time repressuring would be contemplated. Also, owing to retaining gas in solution,

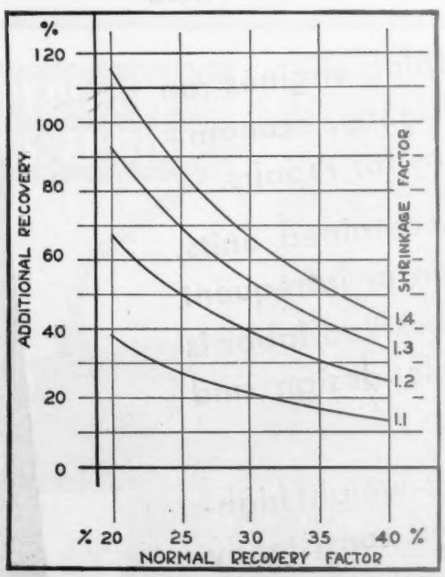

Fig. 1—Additional recovery by pressure maintenance
(1) Shrinkage factor is volume at reservoir conditions of a unit volume of oil in the tanks. (2) Normal recovery factor is per cent of original reservoir oil to be produced by conventional means. (3) Additional recovery is in per cent of normal recovery.

oil in the formation has minimum viscosity and surface tension and an additional amount of oil probably can be recovered in excess of that to be produced by initiating repressuring at the time of depletion.

Further calculations have been made similar to the sample above covering the usual range of recovery factor and shrinkage relationships. These calculations are presented graphically. Fig. 1 shows the additional recovery to be obtained by pressure maintenance expressed as a percentage of the recovery by ordinary means. Fig. 2 gives the same information expressed in terms of per cent total recovery of oil in place.

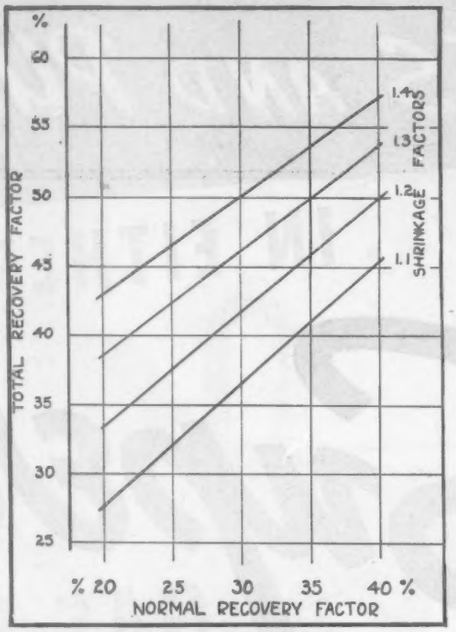

Fig. 2—Total recovery by pressure maintenance
(1) Shrinkage factor is volume at reservoir conditions of a unit volume of oil in the tanks. (2) Normal recovery factor is per cent of original reservoir oil to be produced by conventional means. (3) Total recovery factor is per cent of original reservoir oil to be produced if pressure maintenance is utilized.

Expressed algebraically, the calculations take the following form:

$$Q = \frac{1 - (1 - R) - \left(\frac{1 - R}{S}\right)}{R}$$

R = recovery factor, by primary means.
S = shrinkage factor.
Q = extra oil to be recovered by pressure maintenance, in per cent of primary recovery.

The shrinkage-solubility curves for the oil and gas in any reservoir being considered may be used in conjunction with the weighted average bottom-hole pressure to determine the advisability of initiating pressure maintenance after withdrawals have resulted in partial depletion and lowered reservoir pressures. The accompanying curves may be referred to, using the shrinkage factor for average bottom-hole pressure at the particular time, rather than the shrinkage factor for the oil at initial conditions. Similarly, it may be planned to inject only a fraction of the total produced gas. A volumetric calculation may be made for bottom-hole pressure which would prevail under the conditions of partial pressure maintenance when oil withdrawals equal those expected under normal means of production at depletion. Shrinkage factor at the computed pressure can be used to estimate recovery by pressure maintenance. The assumption is that pressure will be maintained at the computed value until depletion is complete. Many other methods of applying the principle discussed in this paper will suggest themselves to the engineer.

Some of the factors which might affect recovery by pressure maintenance are: (1) Viscosity; (2) surface tension; (3) quantity of free gas in the reservoir; (4) percentage of connate water; (5) porosity of the formation; (6) permeability of the formation; (7) wettability of the reservoir rock; (8) bottom-hole pressure; (9) temperature, and (10) water drive, if any.

An examination of these items discloses that most of them alter the primary recovery factor, and affect pressure-maintenance recoveries only indirectly, as calculated. However, the quantity of free gas, the water drive, and the wettability of the reservoir rock should be given special consideration.

Careful coring and reservoir study will indicate the quantity of free gas in place. If properly conserved, this gas will assist in maintaining pressures and cause the normal recovery to increase, in accord with the principle discussed in this paper. Bottom-hole pressure and withdrawal studies will indicate the proper adjustment to be made in the recovery factor. The effect of a partial water drive is similar, although it is more difficult to analyze involving a detailed study of the reservoir and the manner of water encroachment, which is frequently irregular. Often it will be found that large quantities of oil are bypassed and trapped by the water. Pressure maintenance minimizes this loss, although each case must be considered individually.

The effect of the wettability of the reservoir rock is to place an upper limit on recoveries by any means in use today, short of mining the rock and extracting the oil content with a suitable solvent. This unrecoverable quantity is usually referred to as "residual saturation" and must be determined in each case by core analyses. Calculations by the suggested method or any other, which indicate total recoveries close to the residual limit should be considered carefully. Such a case would be rare, however, requiring a very large shrinkage factor and a comparatively high residual saturation.

New Opelika Recycling Plant Provides Flexible Operation

(Continued from Page 48)

tal blimp tanks, the latter originally installed for storage of a gasoline product. A pipe-line pump moves plant production through the 4-in. Gulf pipe line to Big Sandy, 38 miles distant.

Plant Balance

The converging gas stream at the plant shows a representative analysis similar to that shown in the accompanying table:

Hydrocarbon—	Mol %
Methane	82.15
Ethane	6.50
Propane	3.80
Isobutane	0.75
n-Butane	1.00
Pentanes	1.30
Hexanes and heavier	4.50
Total	100.00

Plant production represents pentanes and heavier, and must not contain more than 1 per cent of butanes and lighter fractions. At present operating conditions, the yield of such a product averages 56 bbl. per 1,000,000 cu. ft. of gas, or about 4,200 bbl. daily.

Plant runs have been conducted at various absorption pressures and lean-oil circulating rates. Absorption pressures were varied between 1,725 and 1,900 lb. per sq. in. and oil rates ranged from 68 to 130 g.p.m. Best optimum conditions have been tentatively established at 1,800 lb. per sq. in. and 115 g.p.m. An oil rate of 130 g.p.m. shows some gas carry-over from the absorption tower. Experimental runs will be continued in a study of the effect of pressure and oil rate on production.

During the first several weeks of plant operation, simple pressure reduction was employed to obtain condensate. The plant yield averaged 46-48 bbl. per 1,000,000 cu. ft. of gas. After absorption was begun, the yield increased to 56 bbl. per 1,000,000 cu. ft. The loss of 10½ bbl. per million without absorption has thus been cut to ½ bbl. per 1,000,000 cu. ft. of gas, which is returned to the reservoir with the residue gas.

Universal Unions on Steam Line

An operator of a portable steam-generating unit has eliminated rigging-up problems by installing universal-type unions in his steam line. This makes the line more like a steel hose and it can be hooked on to a tank or a tubing string in a few moments. The steam line remains connected to the steam generator and lays on the truck bed.

Operating Ideas

Extensions Provide Floor Control of Valves

Where the pipes carrying make-up water, fluid for jets, and steam for siphons are located under the derrick, many steps are saved and closer observation of results attained by providing extensions for the valve wheels so that manipulation may be made from the floor. Hasps or large staples, driven into the edge of the planks, provide upper supports for the extensions, their lower ends being supported by the yoke or fork with which each is fitted to permit engagement with the handwheel of the valve. To lessen possibility of the wrong valve being wheeled, those used only infrequently are unshipped from the handwheels when not in use, and require spotting before they can again be used. This requires only little time.

Adjustable Support Eliminates Line Strain

A flat-topped A-frame of 2-in. pipe, and with a groove into which fits a standard 3-in. steam line, serves to carry the main from boilers to drilling rig. Tee-shaped sections of 1½-in. pipe, fit within the 2-in. legs of the supports and provide adequate

footing. Quarter-inch holes, drilled through frame leg and upright section of the tee footing, at ½-in. intervals over the length of open pipe in each, permit the top of the support to be adjusted at any desired pipe level. This does away with any sags which otherwise might impose severe strain on valves, collars, or other fittings. Pins fasten the adjustable sections in place, while wires run through holes near the ends of the pins to prevent them from slipping out.

Skid for Blowout Preventer

Transportation of blowout preventers between wells requires careful handling of the unit if flanges and other parts are not to be damaged by other equipment loaded on the same truck. One contractor makes special skids for the preventer, with yokes against which the unit may be firmly held by chains and boomers, and with four cans in which the rams may be stored. These ram cases are formed from sections of heavy pipe of the proper diameter and length, with heavy lids or covers of steel plate to which has been welded a rim or flange sufficient to fit down around the ram case. Short pieces of chain, welded to the covers, permit them to be firmly attached to the cases, and even padlocked if desired.

Steels and Alloys Developed for High-Temperature Refining

By B. B. MORTON
International Nickel Co., Inc., New York*

A.S.M.E.

This paper outlines the steps which have been taken in the development of steels and alloys for use at elevated temperatures. Various tests, such as creep, rupture, and relaxation, which have been used in this development, are briefly discussed. A review is also given of the different alloying elements upon the steels and alloys. Paper was presented before the Petroleum Division at the semiannual meeting, Kansas City, Mo., June 16-19, 1941, of the American Society of Mechanical Engineers.

THE development of steels for use at elevated temperatures, in connection with the refining of petroleum, has been guided by two main considerations, namely, that the metal shall have adequate mechanical strength to resist the forces acting upon it, and that it shall possess such a degree of resistance to corrosion and oxidation as to insure an economical life for the parts. It will be appreciated that the two considerations are interrelated to a certain extent for, if corrosion proceeds at a lively rate, there is likelihood of so thinning parts that mechanical failures can occur.

Strength of Materials

The fact that the steels in use were not wholly elastic at elevated temperatures was thrust upon the attention of refiners at an early date. The steels showed a lack of elasticity by enlargement of tubes and other cylindrical forms, as well as by a tendency of parts to elongate. This elongation was often marked in the case of heating-coil tubes which were found draped between supports, after some hours of service, in a manner resembling spaghetti.

As pressures were increased in the refining operations, the behavior of metals at elevated temperatures became of prime importance from the standpoint of safety to life and property. Developments in the chemical industries and in steam generation brought the need for knowledge bearing on this problem before larger groups than were encompassed in the petroleum industry. The result was that intensive studies of the characteristics of metals at elevated temperatures were undertaken throughout the world.

The results that poured in from the earlier investigations reminded one of the first meeting of the seven blind men of India with the elephant. Like the reports of the blind men, each set of results bore some grain of truth but in the composite the accounts appeared garbled and confusing. However, certain facts were established at an early date:

1. Above a certain temperature level, which appeared to vary for different steels, the metal ceases to act as an elastic material and acts more in the manner of a plastic, in that "creep," i.e., continuous elongation in the direction of maximum stress, takes place.

2. Breaks which are transcrystalline when the metals are ruptured in short periods of time at temperatures below about 700° to 750° F. take place around grain boundaries when the temperatures are higher. The location of the break in respect to the crystals varies with the speed of rupture and the temperature.

3. The transfer of major strength from the grain-boundary material (referred to as amorphous material) to the crystal apparently takes place in a gradual manner as the temperature is increased. A region of balanced strength of the two materials naturally exists at some temperature level. This point has been designated as the "equicohesive" temperature by Zay Jeffries,[1] and is of some significance in connection with the theory of the "creep of metals."

4. There appears to be no satisfactory correlation between any short-time tests and the results obtained from creep tests.

5. Within a certain temperature range, roughly, room to 700° F., the mechanical properties of steels used for design at room temperature can be applied, since the effects of carbon content and alloying elements, as well as of heat treatment, can be felt and usefully employed within this range.

Creep Tests

With the thought fairly established that creep-test results were the only reliable means for determining the stresses to be imposed upon operating parts at elevated temperatures (above about 700° to 750° F.), a great deal of creep testing was undertaken.

It was soon developed that three distinct phenomena of creep could be observed during testing of ductile material; otherwise, only two phases appear, Fig. 1. There is an immediate elongation of the metal which results in a permanent set, amounting in some cases to 3 to 5 per cent of the total elongation of the specimen during the test. Following the initial elongation, the specimen continues to elongate at a speed set by the load and temperature. This portion of the curve is used to arrive at the rate of creep; the creep rate being the slope of this portion of the strain-time curve. When uniform creep has proceeded for some time, there often develops a third phase in ductile material in which the rate of flow increases rapidly and rupture occurs.

The appearance of the third phase of rapid creep in a specimen which has been creeping at some low rate indicates the necessity for long periods of testing of the specimens, and, in fact, has greatly influenced the art of creep testing. This third phase distinctly indicates the danger of determining and reporting creep rates based on tests of short duration, say 1,000 hours.

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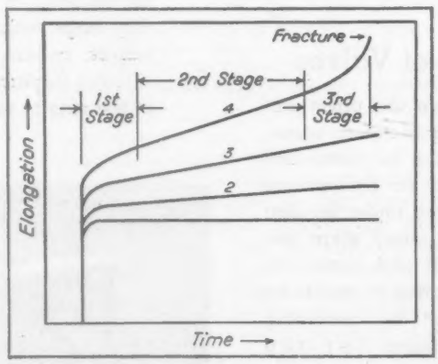

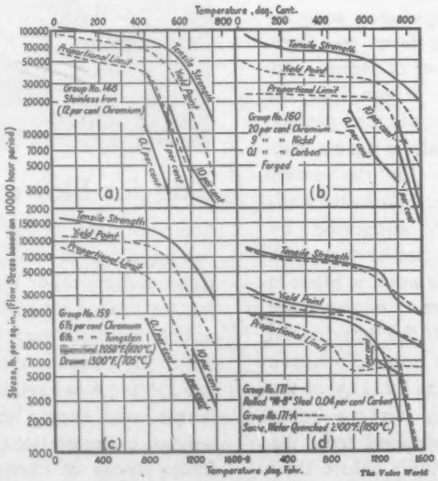

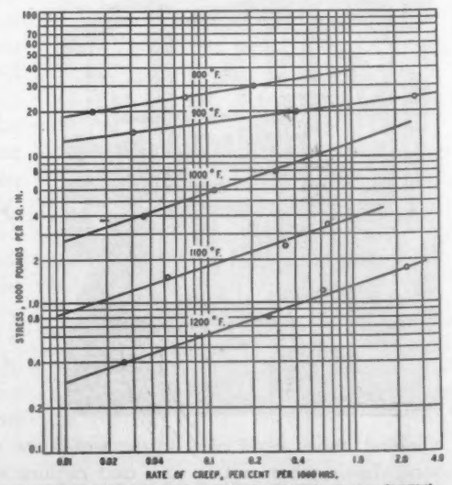

CREEP—STRESS CURVES AT INDICATED TEMPERATURES FOR TIMKEN 1015 STEEL (ELECTRIC).
University of Michigan

Fig. 1 (left)—Typical creep curves. Fig. 2 (lower left)—Stress-temperature curves for "long time" and "short time" tensile tests, plotted with logarithmic stress ordinate. Fig. 3 (below)—Logarithmic plotting of creep data

*Presented under author's title of "Steels and Alloys Developed for Use at Elevated Temperatures in Petroleum Refineries as Still Tubes and Other Parts."

Since the creep rate is taken as the slope of the line representing the second phase of flow of the specimen, the necessity for intensely close controls of conditions surrounding the specimens can be imagined. Decided changes in temperature must be avoided, as well as shock and vibrations. A sensitive method of measuring strain is naturally essential, since each point on the curve in the second phase is a point denoting some increment of strain.

Considering the variables present and the care to be exercised in making creep tests, the amount of good creep data available today is remarkable. In this connection, reference is especially made to work on creep data[3] compiled by a joint committee of this society and the American Society for Metals.

The presentation of creep data is in a number of forms. Each form has some particular use which recommends it. The method used by Kanter and Spring[3] of plotting creep data on the charts containing "short time" test results, Fig. 2, was most useful at the time when the transition in thinking from the use of short-time results to creep results was taking place. The use of logarithmic stress ordinates enhanced the work of these distinguished authors.

The logarithmic plot of stress versus creep rates is widely used, and is particularly useful in indicating the effects of temperature on the rate of creep when several curves, representing results obtained at different temperature levels, are presented in a graph, as in Fig. 3.

The initial deformation which occurs in the creep specimen is often ignored in presenting creep data. In some cases, this deformation may be the controlling factor. Some work done at the Bureau of Standards, Fig. 4, indicates between 0 and 1 per cent the initial deformation to be expected from a given stress load. The secondary deformation (creep rate) is also given.

Creep testing is a precision method, and, when properly conducted, should give precision results. Such results are necessary where close tolerances will exist in the parts used at elevated temperatures. There is an enormous field in petroleum refineries and elsewhere where close tolerances are not required and where slight distortion of parts is of no consequence. Where such conditions prevail, the rupture tests are receiving much attention, and appear to fulfill a distinct need. In the case of heating-coil tubes, the rupture test is considered by many as being more useful than creep testing, since it outlines the regions of stress and temperature within which actual failures may be expected; and, further, it indicates whether or not a ductile type of failure will occur.

As the name implies, "rupture tests" are made by applying varying loads to a number of specimens held at a constant temperature until rupture occurs. The time and stress required to produce failure in each bar is plotted. When plotted on log-log paper a straight-line relation often results, Fig. 5. Elongation accompanying the rupture is often recorded and throws light on the ductility existing at the time of rupture.

A considerable literature bearing on rupture tests is being accumulated, and accurate evaluation of the merits of such tests can probably be made in the near future. To one interested in the design of refinery equipment and conscious of the dangers attending failure of such equipment, there will probably be a tendency to use creep data in conjunction with data from rupture tests. The writer recalls the satisfaction gained from studying the early work of Messrs. Clark and White,[4] dealing with the rupture tests made using tubing samples. . . .

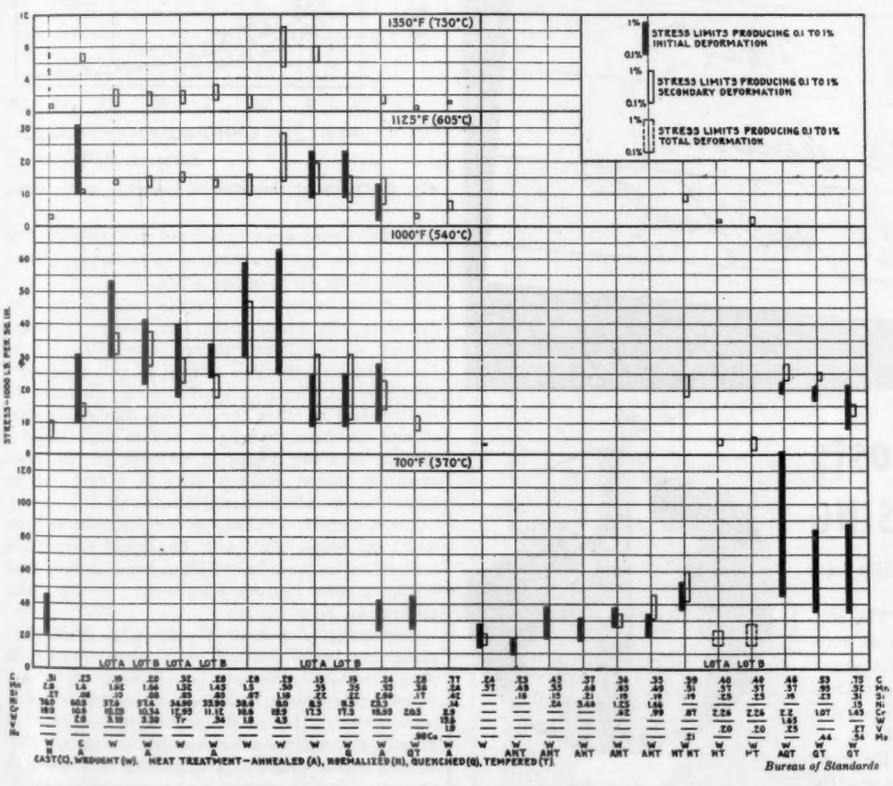
1350°F (730°C)
1125°F (605°C)
1000°F (540°C)
700°F (370°C)
STRESS LIMITS PRODUCING 0.1 TO 1% INITIAL DEFORMATION
STRESS LIMITS PRODUCING 0.1 TO 1% SECONDARY DEFORMATION
STRESS LIMITS PRODUCING 0.1 TO 1% TOTAL DEFORMATION
STRESS—1000 LB. PER SQ. IN.
LOT A LOT B LOT A LOT B
LOT A LOT B
LOT A LOT B
CAST (C), WROUGHT (W). HEAT TREATMENT—ANNEALED (A), NORMALIZED (N), QUENCHED (Q), TEMPERED (T).
Bureau of Standards

Fig. 4—Comparison of alloys on the basis of stress-producing deformation, both initial and secondary

Relaxation Tests

The characteristic of the creep of many steels of taking a large permanent set when first loaded at elevated temperatures can be most annoying in the case of bolts, since this initial "strain" can release a definite amount of stress. Leakage of the joint may result from this so-called "relaxation" of the bolt. A special technique and apparatus is employed in studying the relaxing properties of different materials. It would appear from studies reported to date that structure and dispersion of reaction products in the steel are controlling factors in the tendency toward relaxation of a steel.

From the preceding discussion, it is developed that the creep tests, rupture tests, and relaxation tests are employed in evaluating steels for use at temperatures above about 700° F. Below this temperature (actually 650° F.), it is generally recognized that steels can be treated as elastic bodies, and design can be based on using a factor of safety in connection with the ultimate strength as determined in short-time tests. Reference may be made to the A.P.I.-A.S.M.E. code[5] for details in this connection.

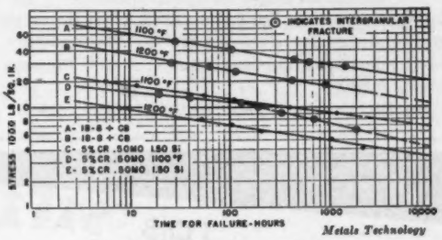

Fig. 5—Results from rupture tests

Chemical Composition

As previously pointed out, steel to be used in refinery equipment at elevated temperatures often must possess resistance to corrosion and oxidation. Corrosion resistance is usually conferred on steels by alloying elements into their composition. Steel is also often protected from corrosion by cladding with suitable alloys and elements. There follows a brief discussion of certain elements used in connection with the steels employed in parts of refinery equipment.

Chromium.—Chromium is probably the most useful element used to protect refinery equipment, operating at elevated temperatures, against corrosion. As an alloying agent, chromium forms carbides and also dissolves in ferrite. It possesses the useful property of taking upon itself a dense, closely adhering scale of oxide or sulfide which acts as a barrier to further attack. It confers this immunity to attack upon iron and nickel with which it is alloyed.

Chromium per se does not appear to affect appreciably the creep resistance of a steel within the usual commercial limits for this element. The benefits to be derived by the presence of chromium in resisting sulfur are shown in Fig. 6.

Molybdenum.—Molybdenum, due to its potent effect upon the creep resistance of steel, is probably the most widely used alloying element entering refinery equipment which operates at temperatures of 700° to 1,300° F. It is added to the chromium alloys containing 2 to 10 per cent chromium to inhibit temper brittleness and to improve creep resistance, and is effective in concentrations of 0.25 and 0.5 per cent. It is added in amounts up to 4 per cent to the 18 per cent chromium-8 per cent nickel alloys to improve the corrosion resistance to certain organic acids encountered in refining.

Tungsten.—The element tungsten is also one of the carbide formers. It shares with molybdenum the property of rendering chrome steels less susceptible to temper brittleness. The presence of tungsten in steels enhances the resistance to creep.

Nickel.—Nickel dissolves in ferrite and does not form carbides. This element does not add materially to the creep strength or corrosion resistance of the low-chromium (1 to 3 per cent

chrome) alloys when it is used in low concentrations. When present in percentages greater than about 7 per cent in the presence of sufficient chromium, the useful, austenitic chromium-nickel alloys are formed, among which may be listed the 18 per cent chromium-8 per cent nickel, and the 25 per cent chromium-20 per cent nickel alloys.

Nickel in concentrations of 12 to 80 per cent is an important element in the heat-resisting alloys.

The chromium alloys rendered austenitic by the addition of nickel have the lowest creep rates at temperatures above about 1,200° F. The structure of the austenite appears to account for the low creep rates.

Silicon.—Silicon additions (up to 3 per cent) to the chromium and to the austenitic chromium-nickel steels appear to improve somewhat the resistance to attack by sulfur compounds and to improve greatly the resistance to oxidation. This element does not appear to improve creep resistance.

Carbon.—Carbon, while having a profound effect upon the mechanical properties of steels at temperatures below about 900° F., does not appear to increase the creep resistance above that temperature. In general, low-carbon values (0.15 to 0.2 per cent) appear desirable in parts to be welded and worked. The carbon content of castings will usually exceed that of wrought materials of the same composition. . . .

There is a wide variety of compositions used in heat-resisting alloys. One of the most common varieties used in oil refineries contains about 28 per cent chromium with 12 per cent nickel. This composition appears to give good economical life in such parts as tube supports, damper parts, and other parts which operate at temperatures of 1,600° to 1,800° F.

Much of the 25 per cent chromium-20 per cent nickel alloy, in both wrought and cast form, is

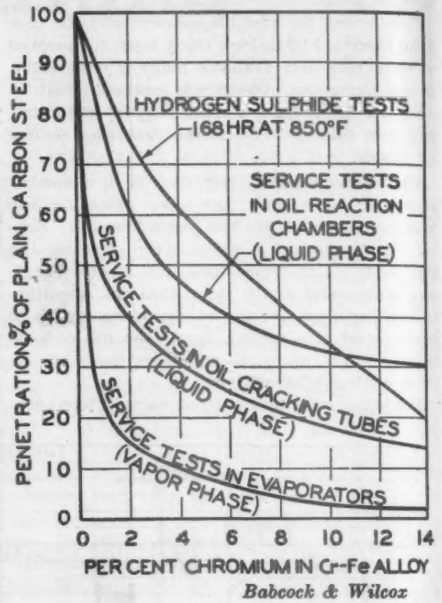

Fig. 6—Effects of chromium in retarding sulfur attack

used for temperatures of 1,800° to 2,000° F. The material has good resistance to oxidation and to sulfur in the form of the oxide.

It should be noted that, while many of the heat-resisting alloys can resist the effects of sulfur dioxide at high temperatures, they often can be destroyed by hydrogen sulfide at the same temperature. A firing system which permits unburned fuel to enter the fire box can set up conditions to form hydrogen sulfide from sulfur dioxide and can result in damage to the heat-resisting alloys. Sodium salts in a fuel can be damaging to heat-resisting alloys.

While there is a variety of compositions of heat-resisting alloys, they will be found to contain chromium to provide oxidation resistance and nickel to give load-carrying ability at high temperatures.

Calorizing, a method of placing an aluminum-aluminum oxide coating on a metal surface, is often invoked to protect parts operating at elevated temperatures. This form of coating is highly protective to the metal part and prevents or greatly retards oxidation and sulfur attack. Calorizing appears especially applicable to protection of bolts serving under conditions conducive to oxidation of the bolt material.

The decided effect of temperature upon the strength of heat-resisting alloys at elevated temperatures (1,000° to 2000° F.) can be seen from Fig. 7.

A considerable quantity of cast irons are used to resist moderate temperature conditions (700° to 1,200° F.) as tube supports, chiefly in the convection section of heating coils.

Desirable properties in cast irons when used as supports in fire boxes, burner parts, etc., are low rates of growth, resistance to oxidation, and a good order of strength.

Ni-Resist* cast iron, containing approximately 15 per cent nickel, 6 per cent copper, and 2 to 4

*Registered trademark.

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LENGTH OF STRING	2,874 Feet
RUNNING TIME	5½ hours
COST	1½¢ per foot

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per cent chromium,[10] has given a good service as tube supports and as dampers. This alloyed iron shows low rates of growth at temperatures up to 1,200° to 1,300° F.

Special processed nickel-chromium irons have entered refinery service in large tonnage as tube supports. These irons contain 0.8 to 1.5 per cent nickel, 0.3 to 0.9 per cent chromium with 3.2 to 3.5 (maximum) carbon values, depending upon grade.[11] In tests simulating conditions of furnace heating and cooling, these irons showed a remarkable resistance to growth and sealing, especially when considering the low alloy contents. The nickel appeared to induce a densely

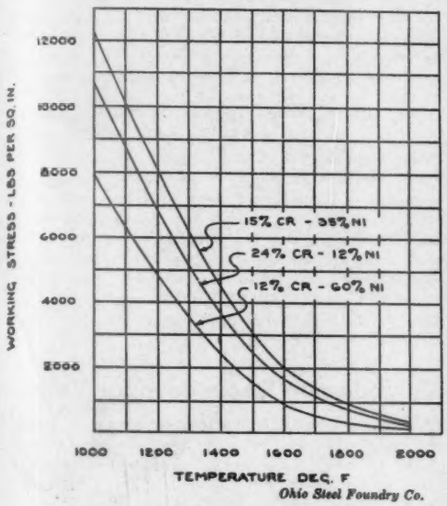

Fig. 7—Working stresses on some heat-resisting alloys

adhering scale which acted to protect the underlying metal.

There is often a temptation to use cast irons as furnace parts where the true nickel-chromium heat-resisting alloys are indicated. Yielding to such a temptation has rarely resulted in any benefit or saving.

Conclusions

In this paper, which is historical in nature, the purpose has been to show that, at an early date in refinery circles, it was noted that metals behaved in the manner of a plastic at certain temperature levels. Based on this observation, an extensive study of the behavior of metals at elevated temperatures was undertaken, often in collaboration with other industries. Creep tests, rupture tests, relaxation tests, and variations of these tests were developed, and results useful to industry have accumulated.

The use of chromium to confer upon steel resistance to oxidation and sulfur attack has been widely exploited, and a series of alloys are available today containing 1 to 28 per cent chromium, generally with other alloy elements present.

Molybdenum is added to a wide range of steels containing carbon and chromium to improve the resistance to creep. In the case of the chromium steels, the presence of molybdenum suppresses the tendency toward temper brittleness. It is added to 18-8 alloy to give greater resistance to certain agents, chiefly organic acids occurring in refinery operations.

Nickel, in amounts of 8 per cent and above, is added to the chromium-containing alloys to form the well-known austenitic alloys. These alloys possess a high order of resistance to sulfur at elevated temperatures. They also possess the best load-carrying ability at elevated temperatures (1,100° F. and above) of available commercial alloys.

A wide variety of chromium-nickel alloys are used as heat-resisting parts of furnaces. The 28 per cent chromium-12 per cent nickel alloy appears popular for this service.

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Progress in METALS

By W. L. NELSON

High-Temperature Steels Contain Silicon

THE advantages of chromium in imparting scaling resistance at elevated temperatures have long been recognized but the use of silicon and of aluminum for this purpose has been developing more slowly. The Chicago Steel Foundry Co. has developed a series of high-temperature steels, some of which contain 2½ per cent silicon. Three of these Pyrasteels are:

	% Ni	% Cr	% Si
For 2,000° service	35-38	17-18	2.5
For 2,000° F. (sulfur gases)	14	25-28	2.5
For 1,800° F. (sulfur gases)	25-28	16-18	2.5

They have also developed a cheaper alloy containing chromium and molybdenum which is recommended up to 1,400° F. This material would appear to be best suited for refinery-furnace castings. Creep strengths of this material (1 per cent in 10,000 hours) are:

	Lb./sq. in.
900° F.	19,000
1,000	11,500
1,100	7,500
1,200	3,900

Failure of Metals by Repeated Stresses

"Prevention of the Failure of Metals Under Repeated Stress," a handbook prepared for the Bureau of Aeronautics of the Navy Department by Battelle Memorial Institute, 273 pp., John Wiley & Sons, Inc., New York (1941), $2.75.

ALTHOUGH the book is written primarily for the aeronautical industry, the importance of fatigue failure to all industry and particularly to the drilling and production branch of the petroleum industry makes this well-written book of vital interest. For many years designers have assumed that the tensile strength and the elastic limit of a material were direct measuring sticks of the working strength. It is obvious, however, that an object that breaks or stretches when the load is applied or after the application of a few loads will seldom appear on the market because the object will be promptly redesigned for greater strength. Even when factors of safety of 5 to 1 based on the tensile strength are employed, failures continue to occur and it is becoming increasingly apparent that fatigue caused by repeated stresses is the primary cause of failure.

The many causes and sources of fatigue failure are discussed in a detailed and practical way. Numerous illustrations of fatigue failure in actual practice are discussed and the various means of combating such failures are pointed out. Among specific design features that are emphasized as being directly related to fatigue failure are fillet radii, notches by threading, keyways and splines, collars and press fitting stresses, welds, riveted joints, tapped holes in castings, polished versus scratched surfaces, roughening of surface by corrosion, inclusions, cold working, and surface coatings. The fundamentals discussed include the fatigue nucleus, endurance-strength curves and test methods, stress distribution, internal stresses, hydrogen embrittlement, the inspection problem, the damage line (above which load the endurance limit is permanently impaired), understressing, overstressing, and crack propagation.

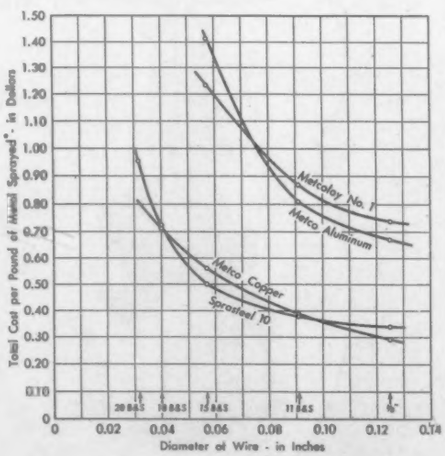
Although the book is practical it still employs the style used by research workers which consists of numerous quotations from the literature without drawing fixed conclusions for the ordinary metal designer. This can be excused because of the difficulty still encountered in predicting the exact behavior of metals under fatigue conditions. Nevertheless, the decision has merely been postponed because rules will have to be stated for draftsmen and inspectors—and it is doubtful whether these decisions will be made by men that are as capable as the authors of this book.

The one point that stands out most strongly before this reviewer is that detail design plays a much more important part in obtaining freedom from failure than most engineers have thought and that short-time strength tests are not a direct function of load-carrying ability except perhaps for static structures. In examining the book numerous applications to the design of petroleum equipment were brought to mind.

Costs of Metallizing

A REMARKABLY rapid growth in the use of the metallizing process has been witnessed in the past 10 years. The cost is now frequently 70 per cent below the cost of 10 years ago. The saving has been due largely to increased spraying speeds and improved equipment which have lowered the labor cost greatly. It is now common to employ batteries of five to eight metallizing guns per unit. Although still greater savings can be expected in spraying speed and types of equipment the Metallizing Engineering Co., Inc., of Long Island, N. Y., states in its Metco News of March 1941 that additional savings must result in part by less obvious improvements in operating technique and supervision. Among the factors that affect spraying costs are (1) equipment and particularly the gun, (2) size of wire, (3) the kind of gas, and (4) the gas pressure.

The newer models of spraying guns exhibit such performance as a constant rate of wire feed, ability to operate on nearly any of the regular gas fuels, ability to handle a wide range of wire sizes, higher spray speeds, less gas consumption, and reliable operation so that one man can operate two or more guns at the same time. The effect of wire size on the cost is indicated by a figure on this page. Although larger wire generally reduces the cost, in special instances where slowing of the rate of wire feed or waste of metal at edges, etc., are primary factors, the use of smaller wire becomes economical.



Effect of wire size on costs of metallizing

Gases that are now employed are acetylene, propane, hydrogen, natural gas and manufactured gas. The use of manufactured gas is limited by its low heating value to the handling of low melting-point metals and slow wire speeds; natural gas is not usually available although it is an excellent fuel; hydrogen is too expensive unless it is a byproduct which cannot be readily marketed; and the oxygen consumption of propane is so great that its use is usually not advisable unless the cost of oxygen is less than $1 per 100 cu. ft. This leaves acetylene as the regular fuel gas but leaves the door open to the use of other fuels in special operations.

The main effect of gas pressure is to permit higher spraying speeds. The most economical gas pressure appears to exceed 25 lb. per sq. in. in most instances and since the National Board of Fire Underwriters has limited the pressure of acetylene to 15 lb. per sq. in., this constitutes the main disadvantage of acetylene gas as against other gases and notably propane, the use of which is not so restricted.

It is regretted that a tabulation of the amounts of metal that are now commonly employed was not included in the cost discussion. Such a tabulation would have permitted a more thorough understanding of the economics of metallizing and would have permitted the consideration of this process for specific jobs rather than limiting the cost study to operations that are already utilizing the metallizing process. From other sources it is learned that the metal loss ranges from 10 to 30 per cent and that thicknesses range from 0.002 in. up to 0.004-0.06 in. for corrosion protection.

Molybdenum Steels Used for Valve

THE use of molybdenum steel continues to invade nearly all fields of alloy-steel construction. One design of valve for withstanding pressures of 1,000-5,000 lb. per sq. in. (Oil Center Tool Co., of Houston, Tex.), utilizes molybdenum steels for all essential parts. The body is cast of a chromium-nickel-molybdenum steel, the stem of S.A.E. 4140 (chromium molybdenum) steel, and the gate cylinder, sealing wedge, and wedge pins, of carburized S.A.E. 4615 (nickel-molybdenum) steel. The valve is constructed with a cylinder having an opening or gate, and the cylinder is moved up and down by a threaded stem and hand wheel. As the gate comes down it is engaged by two so-called wedge pins forcing the gate cylinder against the ports assuring a tight seal and relieving the tendency of the gate to bind.

The composition and final properties of the three steels are as follows:

	Cast body material	S.A.E. 4140 for stem	S.A.E. 4615 for cylinder
Carbon, per cent	0.30	0.40	0.15
Manganese, per cent	0.75	0.75	0.55
Silicon, per cent	†0.25	.....	.....
Phosphorus, per cent	*0.045	*0.04	*0.04
Sulfur, per cent	*0.045	*0.05	*0.05
Chromium, per cent	0.6	1.05	.....
Nickel, per cent	1.5	.....	1.8
Molybdenum, per cent	0.25	0.20	0.25
Tensile strength, p.s.i.	†100,000	146,000	.....
Elastic limit, p.s.i.	†75,000	125,000	.....
Elongation in 2 in.	†18	17	.....
Brinell hardness	205	293	.....

*Maximum. †Minimum.

In finishing the castings they are normalized from 1,600° F. and tempered to 1,200° F. resulting in the properties shown above. They are next rough machined, oil quenched from 1,550° F., tempered to 1,165° F. (which results in a Brinell hardness of 300), and the body bore in which the cylinder moves is ground to a close tolerance.

The S.A.E. 4140 stems are forged, normalized from 1,650° F. to relieve forging strains, oil quenched from 1,575° F. and tempered at 1,200° F. This treatment results in the properties shown here.

The gate cylinder, sealing wedge, and pins are fabricated by forging, normalizing from 1,700° F., machining, carburizing at 1,650° F., quenching from 1,425° F. in water and tempering at 350° F. This steel, S.A.E. 4615, is admirably suited to case hardening because of its freedom from distortion. The hardness of the finished case differs somewhat for the different parts but generally ranges from 63 to 67 Rockwell C hardness (680-750 Brinell).

Development of Rigs Driven by Internal-Combustion Engines

By HARRY F. SIMONS

PRESENT-DAY drilling techniques are the culmination of the entire past history of that branch of the oil industry. They are the result of a gradual evolution in the machinery and the thinking of the men engaged in the search for oil. A better understanding of the conditions encountered in drilling, and development of equipment to perform the work, has made it possible to continue to discover and develop new oil fields in the face of oftentimes adverse market conditions.

During the past 10 years oil companies have been diligently searching for economies and methods of more efficient operation. A reduction in the cost of drilling was necessary if the oil business was to continue to show a profit; a premium was placed on equipment which could more economically do the work. The modern drilling rigs are an answer to the need of the oil industry. Powered by an internal-combustion engine, mounted on a single skid, scientifically designed and suitable for use with either a derrick or a mast, a modern rig is capable of efficient rotary or cable-tool drilling or cleanout and repair work.

The search by oil operators and machinery manufacturers for a means of reducing drilling and well-maintenance costs has always been directed toward improving existing equipment and methods and the development of new. Attention was first directed toward mechanical rigs by the shortage of water or gas in many oil fields. In such areas, the economies possible with mechanical equipment meant an important saving and a reduction in the expense of the development and producing operations.

Portability was another feature which was evidently possible through the use of mechanical-powered rigs. One of the earliest applications of engines to drilling was the so-called portable cable-tool machine which required about half as much time (3 days) to rig up as other types of equipment. Present rigs, either cable-tool or rotary, can now be moved in and rigged up in a matter of hours instead of the days formerly required.

Another important factor has been the development of the high-compression, high-speed industrial engine to replace the old larger engines which operated at slow speeds. The newer engines not only give a superior performance but weigh much less per horsepower delivered. Use of such engines is possible mainly through development of rigs suitable to this type of prime mover.

Economy of operation and reduced moving costs of mechanical rigs were evident from the first but the earliest mechanical rigs lacked flexibility and ease of operation. This was primarily due to the fact that the draw works, or hoist, used with engines was either an old one that had formerly been used with steam, or was designed for that purpose. These hoists had either three (two-shaft) or four (three-shaft) speeds; all clutches were made from steel castings and were either square or jaw type. Between the draw-works hoist and engines it was necessary to install a reversible clutch to absorb the shock of hoisting and to provide a means of releasing the clutches in case the driller was unable to bounce them out with the brake.

Such rigs were difficult to operate as the combination link and throttle controlling the reversible-friction clutch and engines had to be brought to center and the rotation of the draw-works shafts completely, or nearly, stopped before a drum clutch could be engaged; the same was true when disengaging a clutch. Having a limited number of speeds (three or four) it was impossible to obtain the maximum efficiency from the engines except for brief periods during the pulling or running of tools. The rigs lacked both an extremely high gear for

(Continued on Page 72)

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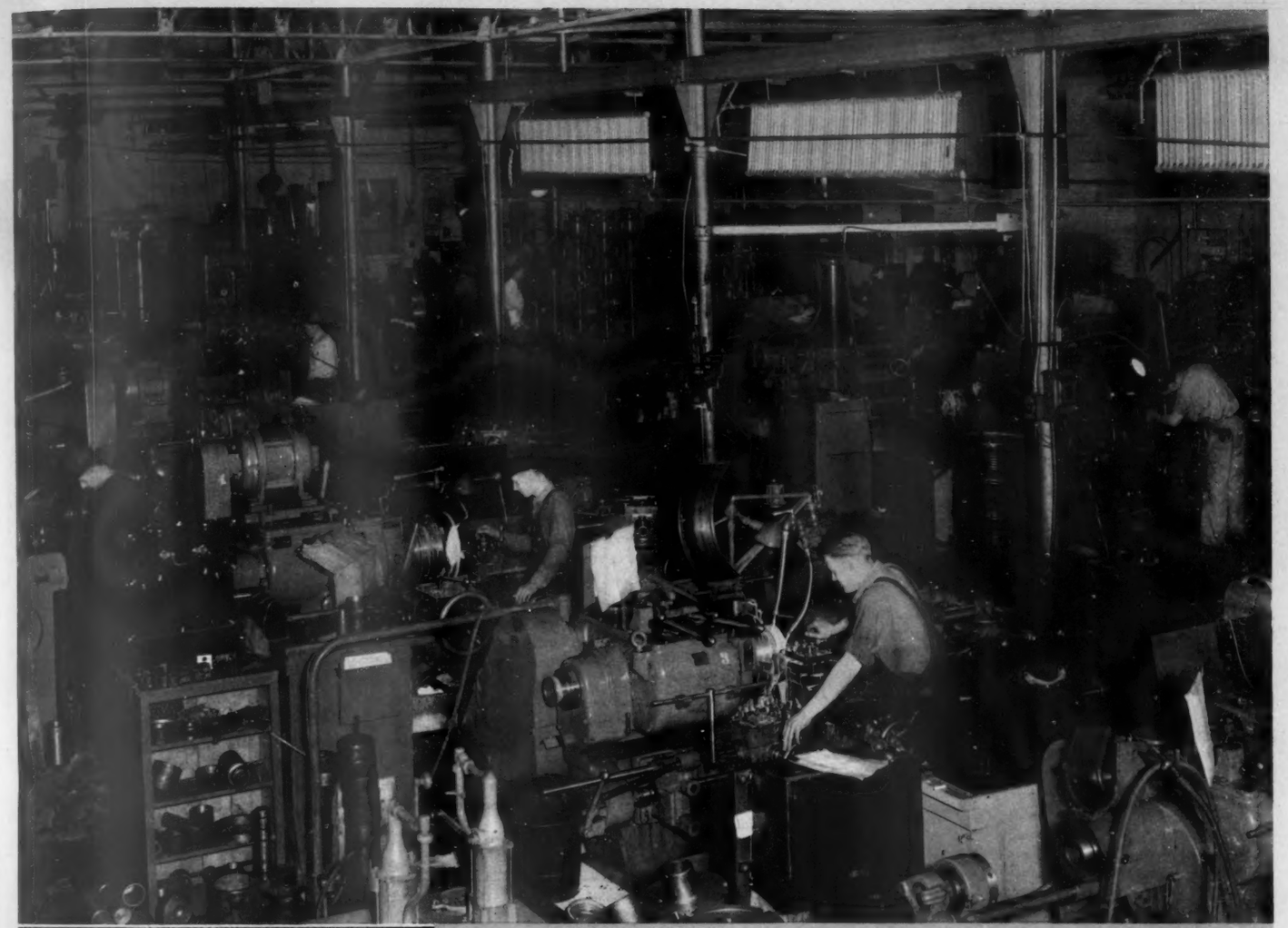
When you purchase a "Cardwell" rig, we feel it our contracted obligation to see that you receive top value.



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running the empty blocks and an extremely low gear for moving heavy loads at very slow speeds necessary to work the bit through tight places in the hole, etc.

It was not until draw works began to be specifically designed for use with internal-combustion engines that the full values in fuel economy and portability could be realized along with flexibility and ease of operation. New devices had to be created and new applications of existing ideas had to be made before the present-day mechanical rig came into existence.

Gradual Evolution

To point to an exact date and say, "Here was the day the mechanical rig came into existence." is impossible as the mechanical rig available today is due to a series of revolutionary and evolutionary changes. It has been a step-by-step process and one accompanied by numerous large and small improvements.

When Cardwell Manufacturing Co. first approached the problem of building rigs driven by internal-combustion engines it had a firm conviction that in this direction lay the opportunity to provide the oil industry with an improved type of equipment at a reduced cost. Since its entry into this field, it has developed a complete line of drilling and servicing equipment as well as pipe-line construction machinery.

Actually, there is little difference between the hoisting operation on a rotary rig, cable-tool rig, or clean-out machine. All consist primarily of winding wire rope on a drum although there is considerable variation on the load being supported or lifted by the wire rope. There are in each case special functions which must be performed which require that the draw works in each case be provided with special equipment.

Evolution and expansion of the types of machines made is not so hard to trace. In 1926, the

MOBILE SERVICING UNIT CARDWELL'S FIRST CONTRIBUTION

H. W. Cardwell, president of the Cardwell Manufacturing Co., Inc., Wichita, Kans., is a native of Kansas as was his father before him, being born near Topeka at Richland. He was educated in Le Compton, Kans., attending both high school and Lane University. Since leaving school Mr. Cardwell has been engaged for the most part in the operation of his own enterprises. In 1907 he entered the contracting field, his first job being municipal construction at Mena, Ark. Mr. Cardwell spent 14 years in engineering and construction contracting.

After leaving the construction field he became a dealer in industrial and farm machinery and it was while engaged in this business that he saw the opportunity for improvement of oil-field machinery and began building hoisting units on tractors. In 1926 he organized his own company and entered the oil-field machinery manufacturing field. From the start he was determined to make the best equipment possible at the least cost to the user as he planned the future expansion of his company.

Mr. Cardwell is greatly attracted by machinery and likes to design, build and operate it. He is constantly searching for new machines to improve his manufacturing process and to improve the equipment built by his company. The Cardwell plant at Wichita includes many machines of the latest type such as multiple drill presses, gear cutters, special lathes, flame-hardening machines, heat-treating furnaces, and automatic acetylene and arc-welding machines. The streamlined production methods employed in the automobile industry are the guides in outlining the production of his own plant. He longs for the day when oil-field equipment can be built on a mass-production basis.

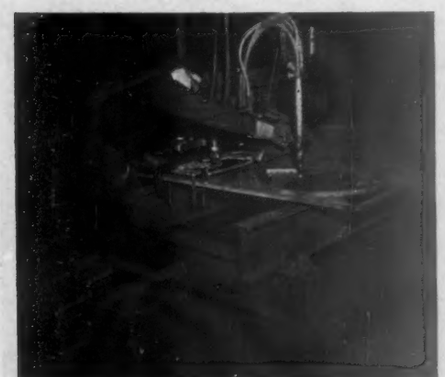
Having an inventive turn of mind, Mr. Cardwell has naturally developed many of the improvements found on his equipment and has encouraged his employes and associates in their efforts along the same line. In fact, he explains that many of the innovations should be credited to the ideas of his engineers, shopmen, and field representatives.

His first big contribution to the pipe-line industry was the live-boom tractor so widely used in pipe-line construction. He designed the clutches used on his hoisting equipment as well as the brakes, transmission, oscillating type spudder, air valve and many other items. He was the first manufacturer of oil-field hoisting equipment to use friction clutches, multiple-jaw clutches, roller-type chain and cut-steel sprockets.

When a problem is facing him, he can't keep from trying to solve it. While Mr. Cardwell was on shipboard during a Mediterranean cruise, he worked out most of the details of the transmission which is used on his draw works. The fact that experts say a thing can't be done, bothers him not one bit. He just goes ahead and does it. Generally he makes a rough sketch, turns it over to the engineering staff and lets them work out details.

For years, Mr. Cardwell has been an enthusiastic supporter of the American Petroleum Institute and has played host at several informal gatherings at his plant during the Mid-Continent conventions held at Wichita. He is also an active member of the Nomads.

Mr. Cardwell, his wife and daughter live in Wichita. A son, Harland W. Cardwell, Jr., is actively engaged in the oil-field manufacturing business with his father. Mr. Cardwell gets so much fun out of his business that he has few hobbies. He does like to play golf.



Some of the modern tools used in the manufacture of drilling and well-servicing rigs. Top, left: Acetylene torch, guided by a pattern, for cutting out parts; Center: Turret lathe cutting inside of pulley to shaft diameter; Right: Automatic cutter for making chain sprockets singly or in multiples. Bottom, left: Brake flange being welded with an electric arc covered by sand, which insures even structure of the metal in the finished product; Center: Clutch drum being machined on a turret lathe; Right: Brake flange being pulled from a heat-treating furnace

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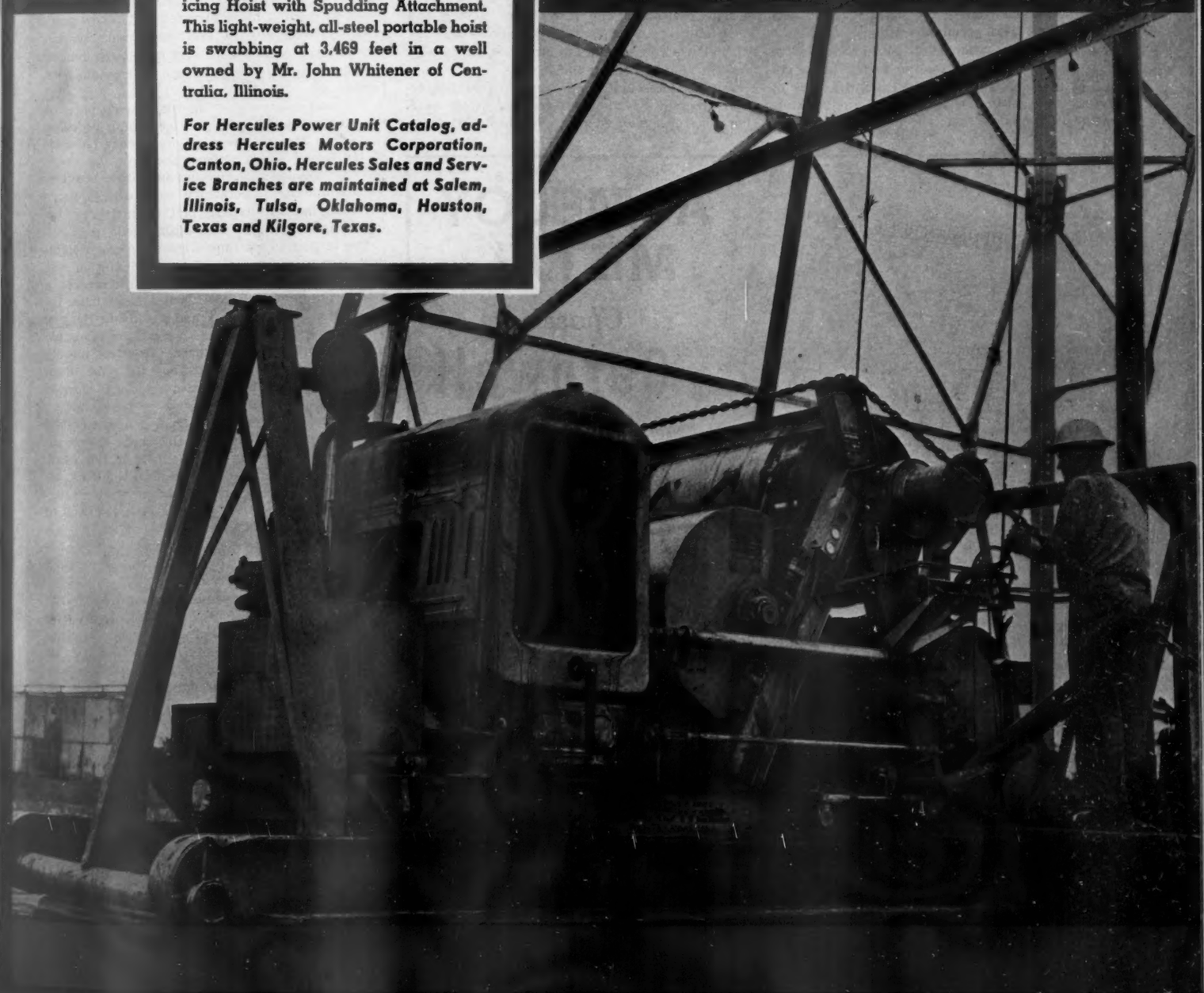
Hercules Model RXC Low Fire Hazard Gasoline Engine (six cylinders, 4⅝" x 5½") is shown at the right operating a Cardwell Model H Double Drum Servicing Hoist with Spudding Attachment. This light-weight, all-steel portable hoist is swabbing at 3,469 feet in a well owned by Mr. John Whitener of Centralia, Illinois.

For Hercules Power Unit Catalog, address Hercules Motors Corporation, Canton, Ohio. Hercules Sales and Service Branches are maintained at Salem, Illinois, Tulsa, Oklahoma, Houston, Texas and Kilgore, Texas.



first Cardwell machine, a hoisting winch mounted on an industrial tractor, was built and put in service pulling rods and tubing on wells in Central Kansas. Demand for this type and the skid-mounted unit caused the entry of the firm into the manufacture on a larger scale. The size of the units was gradually increased to meet the demand for deeper servicing units and by 1930 some companies were using these machines for clean-out work and both cable-tool and drilling operations. In 1931, the clean-out machines were equipped with a spudding attachment and thus became drilling machines and in 1932 a unit was built for rotary drilling.

During 1929 there was a demand for pipe-line machinery as that was a banner year in construction in that division. The live-boom tractor was designed and built and quickly adopted by pipe-line construction men. At the present time, approximately 85 per cent of the pipe lines built use this equipment.

Reduced Weight

One of the first problems met by Cardwell in the manufacture of hoisting equipment was to increase the strength and decrease the weight of the machine. This was accomplished by using improved grades of steel which had greater strength per unit of weight, by revamping and improving the structure of the draw works and by eliminating some of the parts which were nonessential.

By using alloy steels which had greater tensile strength the diameter of the shafts was reduced. Better steels also permitted stronger frames to be built with less weight. Cut-steel sprockets were introduced which gave a large saving in weight and at the same time improved the efficiency of the rig as roller-type chain, in double or multiple strands, was used. This type of chain is lighter and more easily lubricated and its use eliminates much of the objectionable noise made by draw works.

Rotary hoist mounted on a skid with two internal combustion engines and compounding mechanism. While equipped with only one drum, this rig is designed so a second drum can be easily added

The clutches on the drum were also remodeled, made of improved material and by an improved design. Instead of the heavy type having two jaws, multijaw clutches were placed on the drum. This allowed the clutches to become engaged with very little movement of the shaft.

Another important feature in the weight-reduction program was the heat treating of all wearing parts. This allowed straps, clevices, pins, bolts, and rods necessary for coupling the controls to be reduced in size and increased their strength and wearing qualities. While much less bulky than the ordinary pieces, each of these items is more than twice as strong as needed for the load imposed on them. The heat-treated parts show practically no wear after as much as 5 years' service and in some cases where rigs have been remodeled, the original pins, etc., are in condition for further use.

The heat treatment of all the moving parts in the control system and the machining of these parts to a fine tolerance allows a very close fit of the levers which reduces the play and keeps the transmission and clutches in proper position. This eliminates unnecessary wear due to gears not being meshed properly or the clutches not being completely engaged or disengaged.

The largest single improvement in the weight-reduction program was the remodeling of the drum. Formerly, the drum was built around a heavy rotating central shaft with the clutches between the bearing points and the drum flanges. This arrangement presented a condition favorable for the kinking of the shaft, threw an unduly great strain on the bearings, and the momentum and inertia of the heavy drum made rigs slow in operation.

Drum barrels were made from laminated plate steel, rolled into a cylinder; the drum is guaranteed against crushing for the life of the draw works. The bearings were placed on the drum almost immediately against the hangers; the bearings used are of the self-aligning type designed to absorb side thrust as well as radial loads. This was the first antifriction drum developed for oil-field hoisting equipment. The shaft does not turn but the drum rolls freely on it.

For practically all types of work, a draw works having two drums offers many advantages. The second drum permits a bailing or swabbing line to be available at all times. This drum can be used for running wire-line core barrels, hole surveys, etc. In addition it offers a standby hoist in case the lower drum is put out of commission.

By elimination of unnecessary weight through the use of the best heat-treated steels and by remodeling the drum, it became possible to mount a unit (including double-drum draw works, transmission, and an industrial internal-combustion engine) on a single skid which would be hauled by a large truck. Units of comparable depth capacity ordinarily weigh from 75 to 100 per cent more. The largest of this type unit is capable of cleaning out a 10,000-ft. well by either the cable-tool or

CARDWELL MANUFACTURING COMPANY, INC.
WICHITA, KANSAS
May 29, 1941
Acme Foundry & Machine Co.
Blackwell, Oklahoma
Gentlemen:
We are enclosing a photograph of a casting you made for us of a bull bearing for a Model 1500 transmission. We believe this would be an excellent photograph for you to use in your advertisement as it shows an excellent piece of workmanship on your part.
These Model 1500 transmissions have been in use since October, 1938 without a single failure.
The engineers informed us that your Acmeloy is very desirable because of its great strength, reduced machinings and uniformity of castings.
We are also enclosing a photograph of a "Cardwell" rig on which a Model 1500 transmission is installed.
Yours very truly,
CARDWELL MANUFACTURING COMPANY, INC.
Paul A. Lago
Paul A. Lago
Advertising Manager
PAL:ARH
Enc. 2 photos
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TRACTOR MOUNTED INDUSTRIAL AND PIPE LINE CONSTRUCTION EQUIPMENT
DRILLING AND REMOVING RIGS

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Chosen by
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Greater Strength and Uniformity

Acmeloy Metal Combines: Consistency of composition, strength, toughness, density, and machinability in accord with the engineers' conception of a better casting material. Write for bulletin.

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Five

June 5, 1941

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We have used the Timken Tapered Roller Bearings on both the upper and lower drums of our Mobilhoist, as well as the rear and front axles, for several years.

This machine is capably filling the requirement for a practical, fast-moving servicing hoist. It is built to travel not only on the highway and smooth terrain; but also to travel through the familiar mud, sand, snow, and rough roads, which are a part of most oil fields.

These machines have proven to be a great success in every major oil field of the world, due to their portability and rugged construction.

It is a well known fact that bearings are one of the most important parts of any machine. Our customers have obtained entire satisfaction from the Timken Tapered Roller Bearings used in the Mobilhoist, as well as in other machines of our manufacture.

Very truly yours,

CARDWELL MANUFACTURING CO., INC.

G. G. Brown

G. G. Brown
Chief Engineer

CGB/eh

Mobilhoist equipped with TIMKEN Bearings "drilling in" rotary-drilled well, 3,100 feet, with cable tools.

CARDWELL STEEL
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TRACTOR MOUNTED INDUSTRIAL AND PIPE LINE CONSTRUCTION EQUIPMENT

THE TIMKEN ROLLER BEARING COMPANY, CANTON, OHIO

TIMKEN

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TAPERED ROLLER BEARINGS

ELECTRIC STEEL CASTINGS

Examples of TUF-WEAR Castings for Cardwell Manufacturing Company

are "UNIFORM" "100% DEPENDABLE" "VERY SATISFACTORY"

says

CARDWELL ALL STEEL

Chief Engineer Gerald Brown, of Cardwell Manufacturing Company, writes us: "The castings you have made for us have been very satisfactory, due to their uniformity and dependability. In all our experience we have had no failures on these castings."

No industry makes more gruelling demands on steel than does the oil industry. A number of years ago Oklahoma Steel Castings Company set out to develop a series of superior steel specifications that would meet practically ALL of the many requirements of the oil industry for strength, flexibility, resistance to abrasion, etc. Our TUF-WEAR series of alloy steels was the result. Offered in six different specifications, — TUF-WEAR Nos. 1, 2, 3, 4, 5 and 6 — these quality, uniform alloys have met with wide approval and demand. The six standard specifications will meet most requirements, but our metallurgists are prepared to develop and produce special alloys to meet any unusual need. Ask for booklet: "TUF-WEAR Alloy Steel Castings."

We congratulate Cardwell Manufacturing Company on the occasion of its fifteenth anniversary, and wish to express our pride in numbering this successful and rapidly growing company among our regular customers.

OKLAHOMA STEEL CASTINGS CO.
TULSA, OKLAHOMA

the rotary method. It can be moved onto the location and put in operation in less than 4 hours.

Use Friction Clutches

For driving both the single and double-drum models, friction clutches were installed on the countershaft. This permits the transmission to be placed in the desired gear ratio and only the counter-shaft clutch operated to allow engagement or release of the drum clutch.

Satisfactory clutches for service on the countershaft were developed by Cardwell in 1937. With more than 600 rigs in service, none of these clutches has failed to perform satisfactorily. Formerly the best clutches obtainable would withstand only 3 months of service in oil-field operations. The larger clutches are built to withstand a torque of 100,000 in. lb. although the torque requirements at that point are 55,000 in. lb.

This clutch is made in two types, the one for heavier duty being the contracting-band type and the one for lighter duty being the internal-expansion type; both are made from the best grade of heat-treated steel. An outstanding quality of the clutch, due to the design and the bearings used, is its ability to run idle for long periods without danger of heating.

Developed New Transmission

Efficiency of the engine or engines during the hoisting operation is dependent to a great extent on the number of speeds available on the draw works drum. Utilization of the power input decreases as the load is lightened for each respective speed, declining to a comparatively small portion of the engine's capacity before the next highest speed can be used. Development of a transmission having more than the usual three speeds and capable of withstanding the shocks to which a transmission is subjected in field service was required.

The transmission developed has two countershafts and five speeds forward and one reverse. The highest ratio is 1:1 and the lowest is 5:1 with the remaining ratios comprising a set of even steps. A unique feature of this transmission is the meshing of the gears at all times so there is no chance of damaging the teeth while trying to engage them; only the clutches go in or out while changing gears. The gears have straight teeth and are made from the same grade of steel that is used in the most expensive makes of motor cars. The gears are contracted for in large quantities but are assembled in the transmission at the factory. The gear case is of all-steel welded construction. This type transmission is used on all sizes and types of rigs except the draw works designed for 10,000-ft. rotary drilling.

On the heavy rotary hoists (Model Y) a chain-type transmission is used. Roller chain having a 1-in. pitch is used in the required number of strands to obtain the desired strength for power transmission. The chain transmission is completely enclosed in a steel case, making complete lubrication possible. The transmission has three speeds, and, there are two drum drives with a high-speed drive direct from the transmission input shaft to the countershaft for high-speed block return, making a total of eight speeds available on the drum.

Lighter rigs are equipped with heavy-gear transmissions but the single-motor rig (capable of going to 6,000 ft. with 3½-in. drill pipe) has a "Hi-Lo" drive which enables the speed of the line to be doubled in any gear by operating one lever; the light twin-engined rotary draw works (capable of drilling to 7,500 ft. with 3½-in. drill pipe) has a Hi-Speed drive operating between the input shaft and the countershaft which gives a speed necessary for rapid hoisting of the blocks. It is possible to go from any of the five lesser speeds to the high speed and back again without shifting gears in the transmission; this is made possible through the use of friction clutches.

Considerable thought and energy were expended in developing an efficient and safe braking system. This is accomplished by building the drum and flange assembly (totaling seven parts) to a total lateral tolerance of 8/1,000, by using an improved type of brake flange and lining and by improving the braking system.

The brakes are the self-equalizing, self-energizing type. The farther the brake lever is pushed down, the greater braking pressure applied.

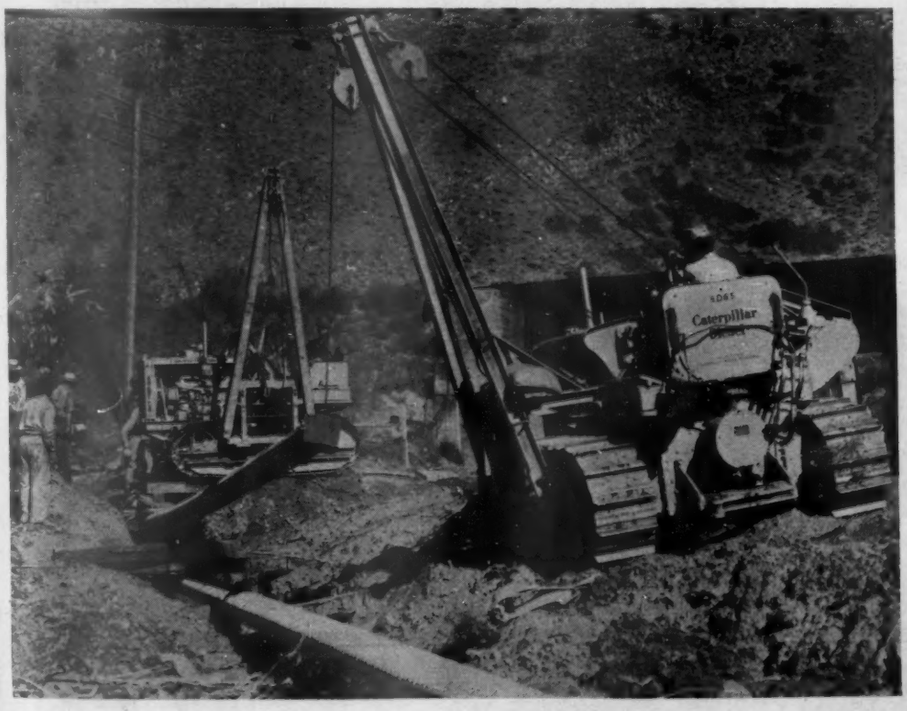
As the brakes are one of the principal points of control, every effort has been to make them as safe as possible. The equalizing mechanism is designed so that if one band fails for any reason, the other band will support the load; the brakes are capable of supporting at least two times the rated capacity of the drums. The throw on the brake shaft is such that in case of complete failure of the remaining mechanism, the shaft will contact lugs on the brake bands and give enough braking power to prevent dropping of the pipe.

Brakes are water cooled with a special retaining ring built on the inside of the drum flanges. The controls for putting the water on the drums include the regular adjusting valves and snap-on valves. A separate adjusting valve is supplied for each flange. It is because of the necessity to use water to cool the drum that it is impractical to use friction clutches on the drum although they are extensively used throughout the remainder of the draw-works drive.

The brake flanges on the drum were formerly considered to be a part which naturally had a short life. This problem was studied thoroughly in 1937 by Cardwell engineers and it was estimated that this item alone was costing operators around $50,000 annually in one field. A special steel was developed by the metallurgical department and this was rolled and heat treated according to rigid specifications. In 1938, sets of these flanges were put on four rigs and these flanges are still in use.

In 1939 it was necessary to replace brake bands on 54 rigs but through the use of the new flanges only 14 replacements were necessary in 1940 despite the fact there were 300 more rigs in serv-

(Continued on Page 80)



Left: Live-boom tractors bending coated pipe on a pipeline project through mountainous territory. Below: Double-drum draw works equipped with a beam for cable-tool drilling. When not in use the beam can be slid to the right out of the path of the line

A Twin Celebration

FOSTER CONGRATULATES CARDWELL!

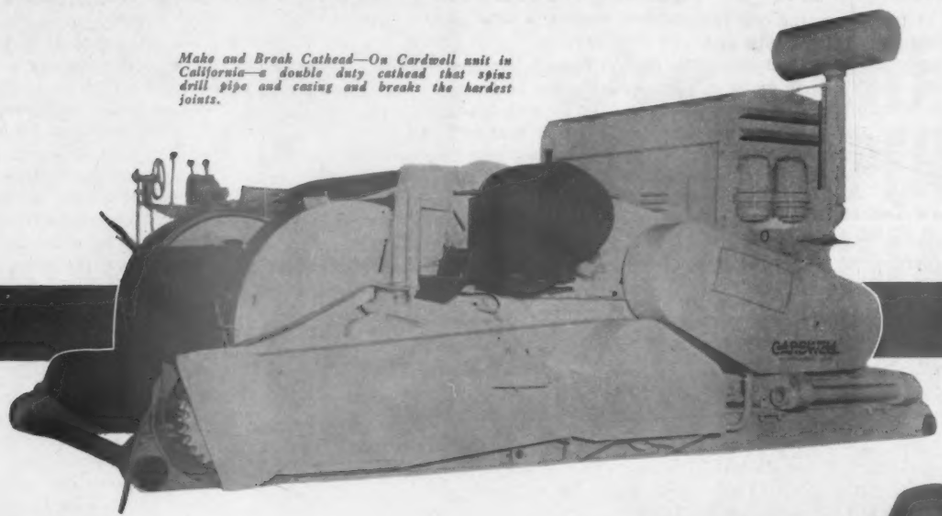
Foster Cathead Company wishes to congratulate the Cardwell Mfg. Co. on fifteen years of progress in the manufacture of Oil Well Servicing and Drilling Equipment.

Foster Cathead Company is also happy to announce that 1941 is its fifteenth ANNIVERSARY as a manufacturer of automatic catheads.

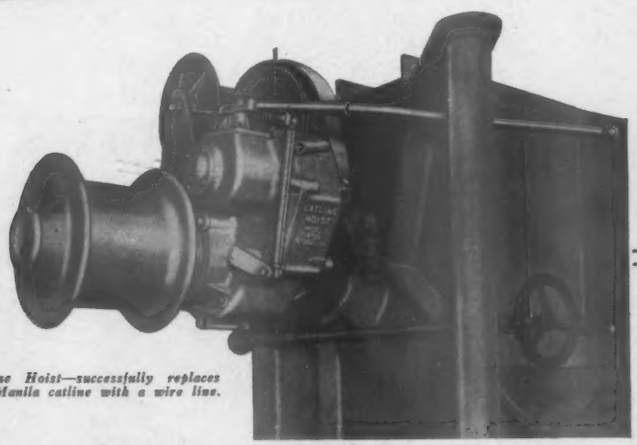
At this celebration of our FIFTEENTH ANNIVERSARY the Foster Cathead Company wished to express its deepest gratitude to the thousands of loyal friends who have made our success possible. We are epecially grateful to the manufacturers of rotary draw works who have adopted our catheads as *standard equipment.*

Whatever your cathead problems may be write us for the answer. We have a cathead to suit every need.

Make and Break Cathead—On Cardwell unit in California—a double duty cathead that spins drill pipe and casing and breaks the hardest joints.



Hi-Speed cathead, made in two sizes—standard for the deepest drilling—Junior for lineshafts 4" or less.



Catline Hoist—successfully replaces the Manila catline with a wire line.

THE FOSTER CATHEAD COMPANY POINTS WITH PRIDE TO THE FOLLOWING FACTS:

We have the most complete line of cathead equipment on the market.

We have more Major manufacturers of rotary draw works using our catheads as standard equipment than all others combined.

Major oil companies and contractors use more of our catheads than all other makes combined.

CONSULT YOUR SUPPLY STORE OR WRITE

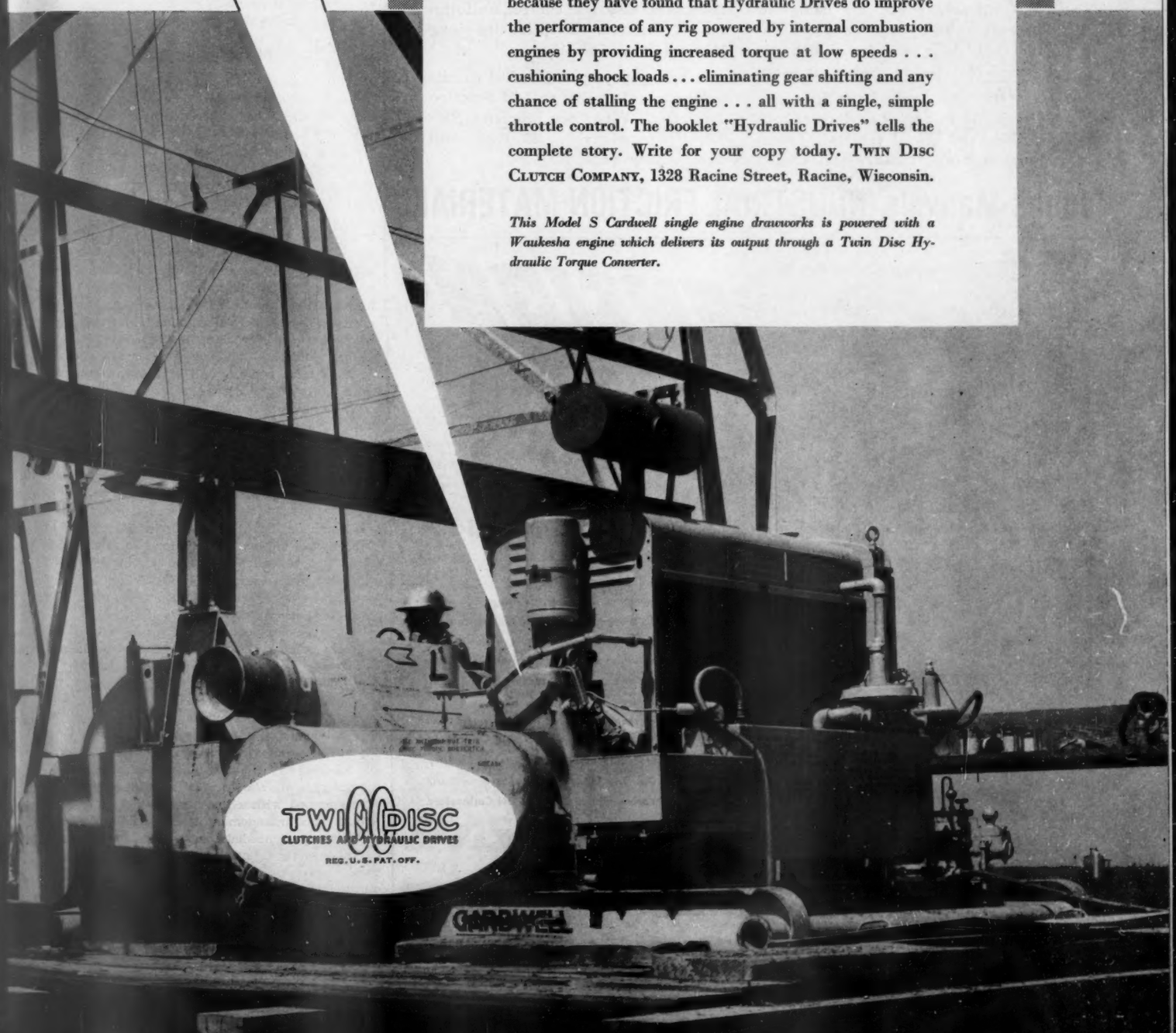
FOSTER CATHEAD COMPANY

BOX 1675 · WICHITA FALLS, TEXAS

one of the first

Always alert to new trends, the Cardwell Manufacturing Co., Inc., was one of the first drilling rig manufacturers to visualize the advantages of Twin Disc Hydraulic Drives for oil field service . . . among the first to adopt this modern development. This judgment was quickly endorsed by operators in every major field who saw in the demonstration of Twin Disc Hydraulic Drives an answer to the problem of combining internal combustion engine economy and portability with the desired characteristics of steam engine performance. Today, Twin Disc Hydraulic Drives are offered by practically all of the leading drilling rig manufacturers because they have found that Hydraulic Drives do improve the performance of any rig powered by internal combustion engines by providing increased torque at low speeds . . . cushioning shock loads . . . eliminating gear shifting and any chance of stalling the engine . . . all with a single, simple throttle control. The booklet "Hydraulic Drives" tells the complete story. Write for your copy today. TWIN DISC CLUTCH COMPANY, 1328 Racine Street, Racine, Wisconsin.

This Model S Cardwell single engine drawworks is powered with a Waukesha engine which delivers its output through a Twin Disc Hydraulic Torque Converter.



CARDWELL "MOBILHOIST"

clutches are factory equipped with J-M Style No. 240 Lining. Every clutch designed by the Cardwell Manufacturing Company during the last three years relies on this Johns-Manville Lining to assure smooth, dependable action.

For light or heavy rigs . . . deep or shallow rigging . . .

JOHNS-MANVILLE FRICTION MATERIALS GIVE BETTER, MORE DEPENDABLE BRAKING AND CLUTCHING ACTION

WHATEVER type of drilling equipment you are using—or whatever service conditions are encountered, there is a Johns-Manville Friction Material to meet your needs exactly.

Available in a wide variety of both flexible and rigid styles, Johns-Manville Brake Linings and Clutch Facings assure unusually high heat resistance, easy load control, uniformity of friction, exceptionally long life and great durability.

It will pay you to get full details on the complete line of J-M Friction Materials. Write for brochure FM-7A. Johns-Manville, 22 East 40th Street, New York, N. Y.

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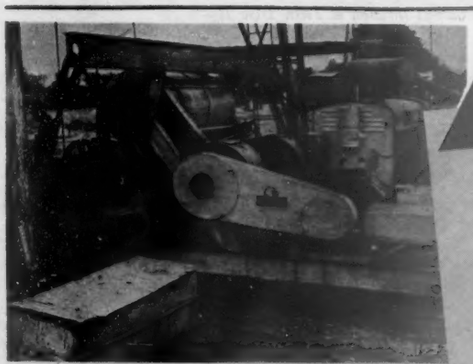


Cardwell Model R double-drum Spudder Rig drilling in a 3340-foot well in Illinois. Power is ENSIGN-equipped.

ENSIGN Congratulates CARDWELL MANUFACTURING COMPANY, INC. on their 15th Anniversary

Cardwell twin-engine Model S Draw Works drilling a 7000-foot well in California. 2 ENSIGN Carburetors are used on this rig.

For fifteen years, Cardwell Manufacturing Company has been building oil well drilling and servicing rigs of outstanding quality and simplicity of design. During these years, Cardwell rigs have *proved* their efficiency and economy on tough jobs throughout the world.

We congratulate Cardwell Manufacturing Company on 15 years of progress and wish them many more years of service to the oil industry. Natural Gas and Butane engines used on Cardwell units are equipped with ENSIGN Carburetors.

Accepted Standard From Coast To Coast

ENSIGN CARBURETOR CO., LTD.
HUNTINGTON PARK, CALIF. • DALLAS, TEXAS • CHICAGO, ILL.

ice. At the same time the cost of this item on new and old rigs was reduced $45.

Spudders

Practically all of the larger draw works with the exception of those designed specifically for rotary drilling, can be converted to a cable-tool machine by the addition of a beam or an oscillating-type spudding attachment. The beam can be put on any machine by installing a sprocket, countershaft and eccentric back of the hoist.

The oscillating-type spudder consists of an arm and guide mounted in front of the drum, an eccentric drive from the catshaft and the oscillator. The drive sprocket on the catshaft replaces the cathead. Strokes available with this arrangement are 36 and 42 in. Changing the rig to a rotary draw works requires about 4 hours and the operation consists principally of removing the oscillator, eccentric and spudding arm and installing the cathead, rotary clutch on the countershaft and rotary drive on the extension of the drum shaft.

Most of the draw works are made to be driven by a single engine although two rotary models are made for use with two engines. The compounding system used includes friction clutches arranged so that it is possible to obtain individual or combination operation of the engines on either the pump or the draw works.

Mobile Equipment

While most of the rigs are skid mounted, other types have been developed, including the tractor-mounted unit, the trailer-mounted unit, and the specially designed Mobilhoist which moves under its own power. Essentially, the trailer-mounted unit is the same as the skid-mounted unit but the tractor-mounted and the Mobilhoist have some unusual features. These two units are powered by the same engine which drives the tractor or the truck part and are built very compactly. They are most generally used for servicing of wells although they are frequently used for both rotary and cable-tool drilling. Both are equipped with masts which are raised in a few minutes; the masts can be easily dismounted and laid aside when the unit is working inside a derrick.

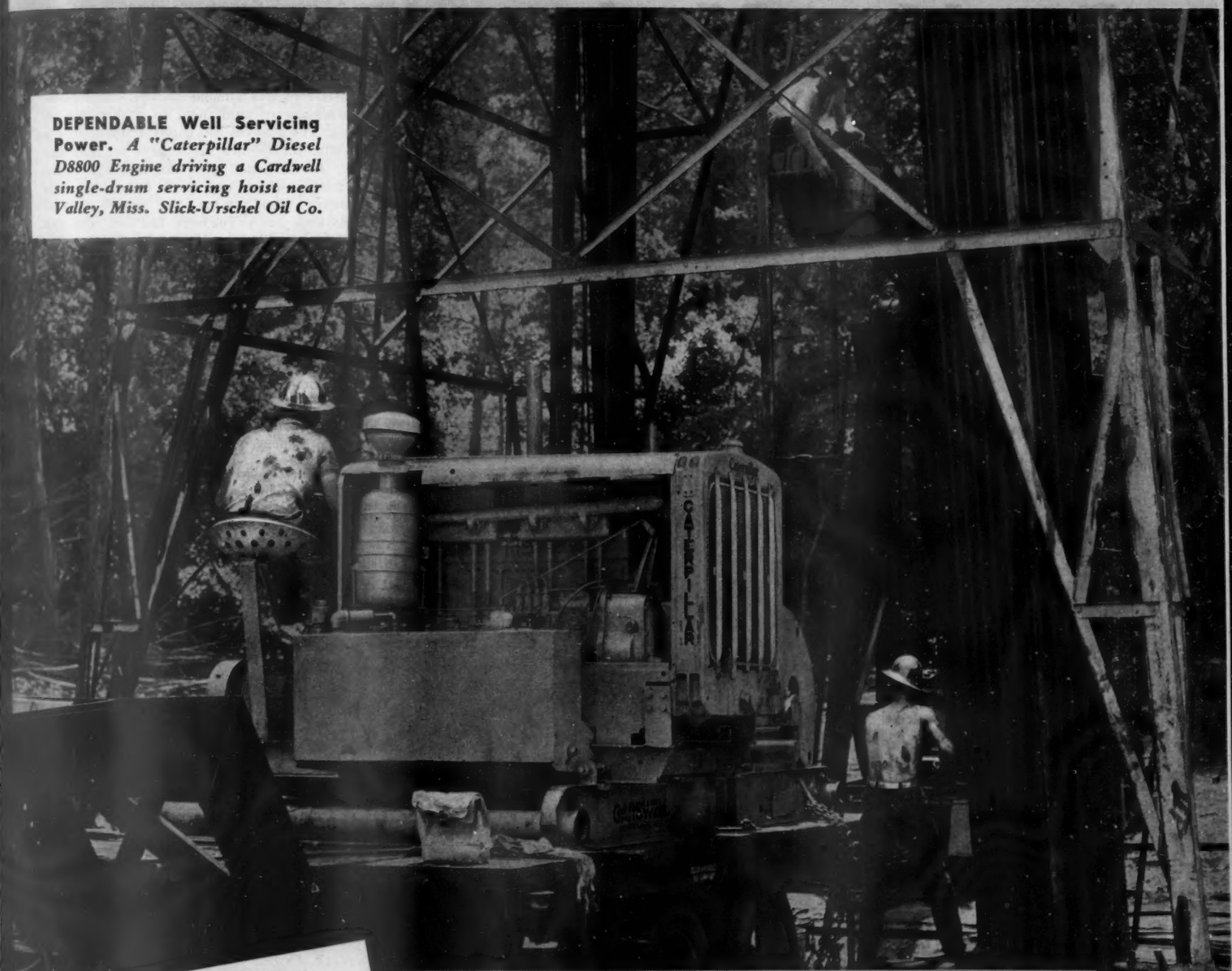
Both single and double-legged masts have been developed for use with all of the various draw-works units, including the rotary rigs.

While much attention has been paid to the constant advancement of the well-servicing and drilling equipment, the live-boom pipe-line tractor has also been improved. This machine consists essentially of a heavy industrial track-type tractor with an extra four-speed transmission and two drums. It is thus possible to simultaneously raise the load and boom and have the tractor in either forward or backward motion. The tractor is also equipped with hydraulically operated counterbalancing weights which make it possible to handle heavy loads while on hillsides or when the tractor is in a tipping position.

The large engineering staff employed by the company makes it possible to include a unique service for the 34 different units made as well as to provide for a constant improvement of the equipment. Each machine produced is adequately blueprinted and parts listed and a copy sent to the rig owner and another copy retained in a special fireproof vault at the factory. On standard models, any changes made at the request of the operator are shown. The individual parts are each stamped with a number.

With this arrangement it is possible to check the exact part needed for replacement purposes on any specific rig at any time. The first rod-and-tubing unit made by the company could be duplicated at any time by simply consulting the records. Any changes made after the particular draw works is put in service are also recorded in the file.

that never Rests!



DEPENDABLE Well Servicing Power. *A "Caterpillar" Diesel D8800 Engine driving a Cardwell single-drum servicing hoist near Valley, Miss. Slick-Urschel Oil Co.*

★ **ESSENTIAL TO NATIONAL DEFENSE** is *dependable power*—for airports, cantonments, naval bases, munitions plants, oil-fields, mines, lumber camps and factories. Defense fronts all!

CATERPILLAR

REG. U.S. PAT. OFF.

DIESEL **ENGINES AND ELECTRIC SETS**

TRACK-TYPE TRACTORS • ROAD MACHINERY

Improved Service Obtained From Wire Lines on Spudding Machines

By M. J. MITCHELL
Markham Drilling Co., Mount Vernon, Ill.

WIRE rope used for drilling lines is one of the more important items of cost in any type of drilling. It is a major factor in the drilling with spudding machines, as excessive wire-line wear and frequent replacement may cause an otherwise profitable operation to become either a marginal or a money-losing one.

In the operation of the Markham Drilling Co. in Illinois, service obtained from drilling lines has been unusual as compared to that normally obtained from wire rope used for such purposes. Service of 12 months from a single wire rope is not unusual and as much as 15 months' service has been obtained on several rigs. While wire rope has been improved in recent years, it is felt that this highly economical service is due primarily to the type of rig used.

Markham Drilling Co. during the past 3 years has completed over 450 wells in the Illinois basin; more than 250 of these were completed for one major oil company. For this completion work, seven rigs of three types have been used. These rigs are Mobilhoist. Models H and W Cardwell double-drummed spudders with double-leg masts. These rigs are very portable and can be moved into a location, the mast raised and actual operation started in less than 3 hours. The company owns its own 10-ton tandem truck for moving its equipment.

The mere statement that 15 months' service was obtained from a line means very little unless the type of service and the time the machines were in actual operation is mentioned. These rigs have all been used for completion, or tailing in, of wells on which pipe has been set with a rotary rig. The work generally consists of bailing or swabbing the hole dry, drilling the plug and the pay formation, running the shot, tamping, shooting, cleaning out and running the rods and tubing. This requires from 5 to 8 days, depending on the particular well.

Continuity of Service

As for continuity of service, except for the moving time, none of the rigs has been down for very long. One of the units, purchased over 7 months ago, lost its first tour during the second week in June. This means that the spudding machine was actually engaged in useful work during each 8-hour period in that time. If one well was completed at 2 o'clock in the morning, it was immediately moved to the next location and put to work before breakfast time. For all practical purposes, the machines can be considered as being in as nearly continuous service as is possible in ordinary oil-field operations.

Lines used are ¾-in. mild plow steel, as it has been found that to depths of 5,000 ft. this type line gives the most economical service, with a better motion being imparted to the tools. The mast head (which corresponds to the crown block on other rigs) has 23½-in.-diameter manganese-steel sheaves. This size sheave is slightly larger than those normally used. The spudding motion is provided by an arm located in front of the drum, which is equipped with a sheave free to slide back and forth parallel to the drum. While spudding, it is evident that the line is in almost continuous motion over the spudding and the head sheaves.

In operation, the spudding arm travels from the up position, where the drilling line barely touches it, to the down position, where it is straight out from the drum, the distance depending on the length of stroke being used. The path of the spudding attachment is an arc. This means that instead of the line being snapped, it is merely cradled back and forth with no sharp snaps or shock loads. The use of only two sheaves reduces the reverse bending to a minimum and this is also an important factor in increasing the wire-line service.

The sheaves used show a minimum of wear after long service and have never been in condition where they will damage the line; it has never been necessary to send them to a shop for regrooving. The sheaves are gaged at least once a month with the regular A.P.I. gage for that size sheave. An unusual fact was recently noted when a line which had been run 14 months was removed from service. The sheave showed some marking due to the wire line's cutting and it was debated whether to send it to the shop for regrooving, but it was decided to keep it in service, as it was still in gage. After running a month with a new line, the sheave was examined and it was found that it had smoothed out.

An important part of obtaining satisfactory line service is the proper installation of the wire rope on the drum and lining up of the mast. The spudding units are checked for level before being put in operation. This insures that the mast will be in line with the drum and the fleet angle will not be larger in one direction than in the other. By tightening the line on the drum, it insures smooth spooling for the subsequent layers.

The rigs used have shown themselves capable of almost continuous operation with a minimum of repair. Failure of parts has been very rare and actual wearing of parts has been very little despite the fact that some of these rigs have been in service over 3 years. The repair bills have been less than 0.1 per cent of the revenue obtained from their operation.

Left: Smooth spooling of the wire rope on the drum is important in obtaining long life from a drilling line

Left, below: M. J. Mitchell of Markham Drilling Co. (right), discusses the situation with J. A. Matthews (left), and W. H. Story (center) of the Matthews-Story Drilling Co. The rig is a Model H, double-drum Cardwell spudder with single-leg telescopic mast. Below: Spudding arm has a downward and outward motion which cradles the line instead of snapping it as the tools are picked up

Spudding Machines Used Widely in Illinois Fields

By HAROLD ROWLEY
Big Chief Drilling Co., Salem, Ill.

THE selection of any method of drilling can be justified only as a matter of economy, and the decision to use cable tools for a particular job is due either to reduced costs or because of the superior results obtained. The type of cable-tool machine to be used is likewise a matter of overall efficiency and where the pay is based on a daily rate, important savings may accrue to the oil company if equipment designed for the work is employed.

In Illinois it has been found that rotary tools are more economical for drilling down to the various pay formations but that cable tools are better for completing the wells. When decision is taken to either drill the wells deeper or plug back and recomplete, cable tools again have a distinct advantage. Most of the wells in the state have been completed and deepened by spudding machines.

The Big Chief Drilling Co. became engaged in this work in Illinois in July 1940 when the deepening campaign in the Salem field was under way. Two new Model K Cardwell double-drum spudding machines and a new Model H Cardwell were purchased for this work. Later a pair of Model R Cardwells were shipped in from Oklahoma and a third new Model R was purchased and put in the field.

These rigs were selected because of their suitability for the task at hand. The work at Salem requires that a rig be extremely portable, economical to operate, fireproof, capable of drilling with a lubricator on the well, able to maintain a high rate of penetration and have facilities for rapidly handling rods, tubing and casing.

In considering the cost of a job, the oil companies look to cost per foot for the completed work. In deepening or completion work, this includes a great amount of incidental work which consumes rig time in proportion to the efficiency of the rig. In deepening over 75 Benoist and Aux Vases wells to the St. Louis-Salem zone, the job cost per foot to the oil company was less than $6. This included moving in, rigging up, drilling from 150 to 300 ft. of new hole through predominantly lime formations, swabbing, bailing, running tubing and packer or jet gun for acidizing, rerunning the tubing and putting the well on production. When one considers the small amount of footage drilled, the completion of this work at such moderate costs is outstanding, and is only possible with an efficient type of machine and an efficient drilling organization.

In the present campaign of deepening Devonian wells to the Trenton lime, it is necessary to drill approximately 1,200 ft. of new hole. On the last well completed by Big Chief Drilling Co. for an oil company, it required only 22 days to move in and drill to the top of the Trenton formation, run the liner, cement, wait on cement and then drill 110 ft. into the Trenton lime. Eight days were then required for cleaning out, swabbing, running rods and tubing and putting the well on production. This is not the record minimum time but is simply good average time for this type of job. The drilling of the hole from the Devonian to the top of the Trenton is con-

(Continued on Page 90)

Harold Rowley, author of the accompanying article, is manager of the Illinois division of the Big Chief Drilling Co. He was born in Enid, Okla., in 1912, and attended the Enid High School and Oklahoma A. & M. College. In 1933 he went to work for the Noble Drilling Co. and later became employed by Big Chief. He was superintendent in charge of production and cable tools in Oklahoma and Texas before assuming his present position in 1940.

HAROLD ROWLEY

Above: Ability to spud while either raising or lowering the tools is a feature of this double-drum spudding unit belonging to Big Chief Drilling Co.

Right: Fireproofing of rigs is especially important for completion work and deepening live wells. This is a water-cooled exhaust manifold on an internal-combustion engine driving a spudding machine

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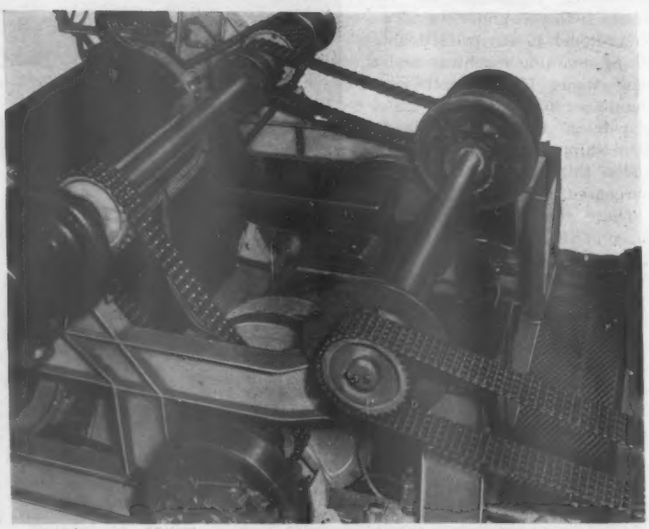

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tract work with the completion of the well being paid for at a flat rate per day.

Portability Important

Portability is one of the important assets of the type of rig employed. All of the equipment necessary to drill with can be carried in two truck loads. One load consists of the spudding unit which is mounted on a steel frame and includes a double-drum draw works with an oscillating spudding attachment and the 148-hp. internal-combustion engine. The other truck load includes the stems, jars, casing equipment and other items, water tank and a butane tank where the work is being done on a location which has no gas for fuel. Where a derrick is over the hole, a crown block is also included and when no derrick is available, the work is done with a single-leg telescopic mast.

All this equipment can be removed from one well, moved and rigged up ready to go on another location in 2 to 3 hours. Recently one of the Big Chief rigs was pulling the rods on a job in less than 2½ hours after receiving the contract. Moving costs for the rigs have averaged around $25 per job.

The same speed is obtainable when swabbing and bailing and it provides an important saving to the oil companies as this part of the job is pair for on a per diem basis. On a well now in the process of completion, the 4,500-ft. hole was swabbed and bailed dry, cleaned out, plug drilled and 40 ft. of new hole made in 24 hours. This again is not record time but is merely a good average time for this work.

Running casing or liners is a simple task and can be done as easily with the Cardwell machines used by Big Chief as it can with a rotary rig. It required only 5½ hours to run and land 4,500-ft. of 5½-in. 15-lb.-per-ft. pipe on a recent well. For this work six lines were strung through the blocks which are similar to those used on medium-depth rotary rigs. A weight indicator was used on the dead line, an unusual practice on spudding machines or cable tools used in Illinois. This allows the driller to receive some warning of tight places or cavey spots before there is any great danger of sticking the pipe. Another feature of the type rig used by Big Chief is the cathead which allows tubular goods to be spun up; it also is a great time saver in rigging up and in moving tools in and out of the derrick.

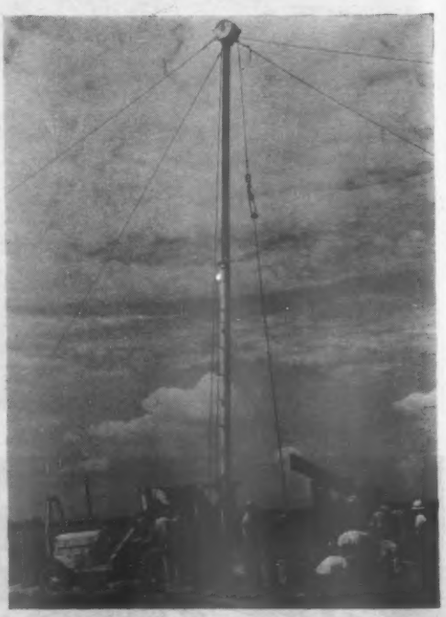
As most of the deepening work is done on live wells, it is extremely important that the spudding machine used be designed so it can work with a lubricator and that it be completely fireproof. The 148-hp. GAK Waukesha engines are equipped with vaporproof magnetos, arcproof wiring, shortproof caps for the spark plugs and oversized radiators to cool the extra water needed for water-cooled manifold. Generally gas is available at the location or from a nearby well but in some cases it is necessary to use butane for fuel; these tanks are equipped with the usual safety devices and are kept some distance from the rig.

Maintenance cost of the rigs used is very low and long life is secured from the wire lines used. As there is no clamp needed and a minimum of bending of the drilling line, practically all of the wear on it is due to its contacting the sides of the hole.

Deepening Salem Wells

For the work at Salem, 36-ft. by 4½-in. stems are used for deepening from the Devonian to the Trenton and 20-ft. by 4½-in. stems were used for deepening from the Benoist or Aux Vases to the St. Louis-Salem section. The shorter stems were required in the latter case as this work was done with masts with a lubricator on the control head. Seven and nine-foot bits with straight water course are used. Each well drilled in the field has its own peculiarities although there is a general similarity. However, in some Trenton wells a cherty section is encountered in the lime from 3,600 to 3,800 ft. and it may be necessary to dress quite a large number of bits.

An unusual job performed by Big Chief with a Cardwell spudder was at the first well to penetrate the Trenton lime in the western side of the basin, the deepest cable-tool hole drilled in the state in recent years. This well was deepened from 4,394 to 5,023 ft. in 45 days. The hole drilled at that depth was 3⅛-in. as there was 4½-in. pipe in the well. Sulfur water was encountered and the hole was full of water most of the time; lime formations penetrated had a tendency to cause a tight hole. The fact that such a small-diameter hole could be drilled such a distance at that depth in a comparatively short time indicates that the spudding machine used has an unlimited application.



Pulling rods on a well with a Mobilhoist rig. The machine is also commonly used for completion work and drilling deeper

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Pipe-Line Activity

Eight-Inch Line Proposed From Apache to Oklahoma City

Plans for a 74-mile pipe line running from the new Apache pool in Caddo County, Oklahoma, through the Cement pool and on to Oklahoma City where it would connect with the Texas-Empire Pipe Line Co. trunk line to the Mid-West were being held up last week pending completion of the Apache discovery well. There was also a question, according to J. K. Goldrick, of the Texas Pipe Line Co., Tulsa, as to whether it would be possible to obtain the necessary pipe.

The line would be at least 8-in., and besides providing outlet for the Apache crude would be the first important outlet for crude from the big Cement pool nearby. At present the only outlet for the huge reserves at Cement is at the Anderson-Prichard refinery at Cyril which has a daily capacity of about 6,500 bbl. The new line would also be the first to connect any of Oklahoma's southwestern pools with the mid-western markets. Connections at Cement have already been arranged.

Gas Line Completed From New Michigan Fields to Saginaw

MOUNT PLEASANT, Mich.—Consumers Power Co. has completed a new 12¾-in. gas-transmission line tying in for market three new gas fields in Missaukee, Osceola, and Clare counties to the company's gas-distribution system in the Saginaw Valley industrial area. The pipe line, 60 miles long, was started last December and built at an estimated cost of $900,000. It represents the largest single piece of pipe-line construction in the state since 1936.

Mid-Continent Oil Displaces Venezuelan Crude in Line to Canada

George Peffall, assistant United States customs collector at Philadelphia, today disclosed that a pipe line running from the Sun Oil Co. processing plant at Marcus Hook, Pa., to Port Huron, Canada, by way of Detroit, has been closed for a month because of a shortage of tankers.

"Until recently an average of three tankers a month have been unloaded at the Sun Oil Co. plant," Mr. Peffall said, "and the crude oil after being processed was pumped to Canada."

After the shortage of tankers made it impossible to supply the line from South America, the Mid-Continent Petroleum Corp. agreed to furnish oil from the Mid-Continent fields to the border connection at Port Huron.

Steel Ordered for Plantation Line With Increased Capacity

Preparations for construction of a common carrier pipe line to deliver gasoline and other refined products to seven southeastern states are being rushed by the Plantation Pipe Line Co. in anticipation of passage of the Cole bill (H.B. 4816) by Congress.

Officials for the line said that orders had been placed for 123,000 tons of steel pipe and that the engineering contract has been let. An office for purchase of rights-of-way has been opened in Meridian, Miss., and additional offices will be opened shortly. Pipe delivery is expected to start in July and to be completed in October.

Held up for more than a year by inability to obtain crossing rights from railroads, the line can be completed within 7 to 8 months after materials have been received and right of eminent domain is authorized by the Cole bill, for which President Roosevelt and Harold L. Ickes, defense oil coordinator, have recommended expeditious passage.

Originally planned for a delivery capacity of 33,000 bbl. per day of refined petroleum products, the line has undergone upward revision to 60,000 bbl. per day. By adding additional pumping stations, the pipe line can be increased to its maximum capacity of 90,000 bbl. per day. The area to be reached by the pipe line normally receives 89 per cent of its petroleum products in whole or in part by tankers moving from the Gulf Coast to the Atlantic seaboard. On completion, the new line will supplant the use of 10 to 15 tankers.

There are 18 Army camps completed or under construction in the area to be served by the line and approximately 17 per cent of the aviation gasoline required for military purposes this year is to be delivered to this area. The new line will deliver gasoline, kerosene, heating oil, and tractor fuels.

The Plantation company is jointly owned by Standard Oil Co. (Kentucky), Shell Union Oil Co., Inc., and Standard Oil Co. (New Jersey).

Eastern Pipe-Line Deliveries Set New Record in May

Crude-oil deliveries through nine eastern pipe lines formerly in the Standard Oil group in May established a new record.

Deliveries in May totaled 22,850,000 bbl., compared with 21,010,000 bbl. in May 1940, or an increase of 8.8 per cent. Deliveries were 13.7 per cent above those a month earlier.

In the first 5 months deliveries through the nine lines totaled 100,263,000 bbl., against 94,910,000 bbl. in the comparable period a year earlier.

Traffic of the nine lines for May and for the first 5 months of 1941, compared with the corresponding 1940 periods follows, in thousands of barrels:

	May 1941	May 1940	5 mos. 1941	5 mos. 1940
Buckeye	8,299	7,414	35,238	29,920
Eureka	1,023	878	4,055	4,210
Illinois	6,411	6,501	27,273	31,960
Indiana	2,235	1,682	9,899	7,396
Natl. Transit	1,436	1,592	7,031	7,475
N. Y. Transit	759	556	3,737	2,779
Northern	902	790	4,605	3,499
Southern	496	424	2,965	1,993
SW. Penna.	1,289	1,173	5,460	5,678
Total	22,850	21,010	100,263	94,910

Construction to Start at Once On Montreal Crude Line

Construction on the new pipe line to carry crude oil from Portland, Me., to Montreal, Canada, is expected to start at Gorham, N. H., this week, according to officials of the Portland Pipe Line Co., which has been organized by the Standard Oil Co. of New Jersey to construct the American portion of the line. The Canadian portion of the line will be constructed by the Montreal Pipe Line Co., Ltd., also a subsidiary of Standard.

Initial work will be started by two crews of approximately 250 men each, one working to the east and the other to the west from Gorham. Depending upon the speed of pipe delivery, as many as six crews may be engaged in construction ultimately to rush the laying of pipe to completion by October 1. The line will be in operation about 2 months later.

Following a route surveyed originally by plane, the 236-mile 12¾-in. line, the only crude-oil line in northeastern United States, will pump approximately 50,000 bbl. of crude daily to the refineries of Montreal—saving 10 to 12 days for the hard-pressed tankers. It will cost about $8,000,000.

Esso tankers from Colombia, Venezuela, and Texas unload at a new wharf at South Portland. Six storage tanks, each with a capacity of 140,000 bbl., will receive the crude. Eight pumping stations, each equipped with horizontal, triplex, power-driven plunger pumps, will be built along the line.

Rogers & Vaughn Construction Co. Open New Office at Wichita Falls

The Rogers & Vaughn Construction Co., Inc., have recently opened general offices at 716 Hamilton Building, Wichita Falls, Tex. This company, engaged in pipe line and general contracting, retains yard and field offices on the Old Iowa Park road, Wichita Falls.

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Multiple Length Rotary Hose is still news—but it is old enough to have passed every test drillers have ever devised. There's no pressure build-up at the couplings, no leakage, no chance for metal to wear. Couplings are really built-in—waterway is full size and the shank and face are completely encased in rubber.

With Multiple Length you go down as fast, or faster. It handles perfectly in making a connection and in drilling against terrific formation pressures. Balanced construction with special duck and patented steel bead wire reinforcement provides the flexibility you need, with resistance to the writhing and hammering from the pumps. The super-tough outer cover will stand up to the rough handling you have to give it. Hewitt Rubber Corporation, Buffalo, N. Y.

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FIELD DEVELOPMENTS...

HIGHLIGHTS FROM THE WEEK'S NEWS—

Completions dropped last week from the previous week's high of 661 to 617 with all classes showing a decline. Nevertheless, the week's drilling was still over 600 wells, a mark exceeded on only two other occasions this year. Not included in the week's total are a number of recompletions, particularly in Illinois. The multiple-pay pools of the state provide operators with many possibilities of obtaining additional production from depleted or nearly depleted wells by either deepening or plugging back and perforating. The most conspicuous example is the Trenton production in Salem where many of the Devonian wells had large casing set above the pay with the express purpose of permitting deepening to the Trenton.

Californians are reported ready to try almost anything and as eastern operators are considering the drilling of horizontal wells into outcrops on the sides of hills, it was necessary to consider an even more revolutionary development. It is now proposed to drive a tunnel under the sea and drill from large submarine chambers. Interesting possibilities of what might happen in case of a blowout come to mind but proponents of the plan claim that it is feasible.

Two 20-year-old fields celebrated their anniversaries by prospective deep development. These were El Dorado, Arkansas, and Long Beach, California. Only a fortnight ago another old-timer came back when Ellenburger production was found in Electra, Texas. These fields were by no means on their last legs, but production had been declining for some time and the new deep developments may give them a more prominent place in the picture. They also demonstrate once more that the lowest known pay in an area must be reached before a test can be considered complete.

An important discovery in West Texas indicates that even that may not be deep enough and that in certain circumstances the lowest known pay should be penetrated a second time before the well is abandoned. Repetition of part of the Simpson and Ellenburger section in an outpost to the Abell field in Pecos County indicates the presence of thrust faulting in that area and promises numerous headaches for geologists in the Permian basin.

The Atlantic seaboard is not the only area affected by transportation difficulties. Kansas production is now practically up to the state's pipe-line capacity and additional facilities are required to handle its growing output.

Michigan's production appears to have reached its low level and turned up again. From around 37,000 bbl. per day, output has risen to 40,000 bbl. due, mainly, to the newly discovered Reed City and Winterfield pools. The former has been placed under proration and is the only pool in the state whose output is now regulated, the others having passed below minimum figures some months ago.

KANSAS: Production stood at a new high for the state at 231,450 bbl. Davidson is extended north and a new Arbuckle pool was opened in Stafford County (p. 103).

MICHIGAN: The Reed City pool has been placed under proration and is to be developed on a basis of 20-acre spacing. Winterfield is bounded on the south by a dry hole (p. 126).

LOUISIANA GULF COAST: Humble's well on the Bayou Sale prospect, Iberville Parish, is awaiting test. West flank production has been found on Bayou Choctaw and Lakeside is extended about ¾ mile north. The new sand on the west flank of Welsh has been defined. Ville Platte may be extended to the southeast (p. 113).

CALIFORNIA: California operators are discussing the possibility of drilling offshore wells from a tunnel with a drilling chamber from which 10 or 20 wells can be drilled. A good producer has been brought in in the Inglewood deep pay. Shell's second Raisin City test is nearing the upper pay (p. 106).

WEST TEXAS: A north outpost to Abell found saturation in the Ellenburger after drilling through a thrust fault. The Tubb pay has been found productive east of Kermit. The Terry County discovery and the 3-mile north outpost to Slaughter are still testing. The latter shows sweet gas indicating that it is in a different pay or is a new field (p. 121).

ILLINOIS: The Trenton at Salem provides about eight or nine recompletions per week and is helping maintain the production of the pool as the wells, though small, hold up well. Either a new pool or a 4-mile extension to Hoodville is in sight in Hamilton County (p. 115).

NORTH TEXAS: Mississippian lime production has been found 5½ miles southeast of the first discovery in Young County. Caddo lime pay has been found in K.M.A. A Cooke County test east of Gainesville is showing oil in the Bruhlmeyer sand (p. 100).

WEST CENTRAL TEXAS: Eight wildcats were started of which three were in the Wimberly area, Jones County (p. 100).

TEXAS GULF COAST: Lochridge may be extended 1 mile north by the H. E. Williams wildcat. A third sand has been found in the Frio at West Ganado, Jackson County (p. 112).

SOUTHWEST TEXAS: A new sand may produce oil on the flank of Agua Dulce. What is believed to be a wedge-edge of Catahoula sand looks like a producing zone on the west flank of Chapman ranch, Nueces County. Midway is extended 1 mile west (p. 118).

ARKANSAS: El Dorado celebrated its twentieth anniversary with production from a new deep pay, a Cotton Valley sand (p. 104).

NORTH LOUISIANA: Another Wilcox pool has been opened in La Salle Parish. It will probably be called the Walters pool (p. 104).

INDIANA: Whisenant & Trenchard's prospective three-sand pool opener has dwindled to a single possibility, the Cypress (p. 99).

SOUTHWEST PENNSYLVANIA: An Oriskany sand test has been started on the Kellersburg anticline in Armstrong County (p. 125).

EASTERN KENTUCKY: A new oil field is in prospect in Menifee County (p. 99).

OKLAHOMA: The old Otoe pool which produced from the Layton sand is now a Wilcox sand producer with a 1,000-bbl. pool opener (p. 96).

COMPLETIONS IN ALL FIELDS . . .

(Week Ended June 21, 1941)

	Oil	Gas	Dry	Total	1941 total comp. to date	1940 total comp. to date
N. Y., Pa., and W. Va.	89	12	9	110	2,530	2,238
Ohio	12	15	13	40	732	584
Kentucky	9	7	9	25	327	218
Indiana	4	3	2	9	216	167
Michigan	3	0	8	11	396	578
Illinois	47	0	21	68	1,535	1,613
Kansas	31	0	8	39	878	798
Oklahoma	22	5	7	34	713	860
Nebraska	0	0	2	2	42	4
Missouri, Iowa	0	0	0	0	9	13
Texas:						
North Central Texas	43	3	17	63	1,368	1,485
West Texas	42	0	3	45	956	1,024
East Texas	13	1	5	19	544	312
Texas Panhandle	14	0	0	14	248	295
Texas Gulf Coast	21	0	4	25	513	618
Southwest Texas	24	2	6	32	838	1,027
Total Texas	157	6	35	198	4,467	4,761
North Louisiana	5	4	5	14	283	294
Louisiana Gulf Coast	14	0	7	21	412	492
Total Louisiana	19	4	12	35	695	786
Arkansas	2	1	4	7	83	83
Mississippi and Southeast	2	0	1	3	119	94
Montana	4	0	3	7	119	98
Wyoming	2	0	0	2	65	70
Colorado, Utah	0	0	0	0	18	5
New Mexico	2	0	1	3	227	358
California	23	0	3	26	494	537
Total United States	428	53	138	619	13,665	13,865
Total previous week	446	67	148	661		
Week ended June 22, 1940	422	32	139	593		

New Wilcox Pool Is Opened In East Central Section

By ROBERT INGRAM

THE search for new Wilcox sand production throughout Oklahoma was given another boost last week by the success of Superior Oil Co. 1 Faubian, SE SW SE 16-22-1, a wildcat in the old Otoe (Layton sand) pool of Noble County, ½ mile southeast of the town of Otoe. The well perforated in the second Wilcox sand from 4,802-30 ft. and made several good performances to indicate a major strike. Oil flowed over the derrick before the well was killed to run tubing.

Tanks were built while tubing was being run and then, after cleaning itself into the slush pits for a few moments, the well was turned into a 210-bbl. storage tank and flowed at the rate of 40.5 bbl. an hour through a ¼-in. choke, with 1,150 lb. pressure on the tubing. A "thief" of the accumulation in the tank showed no water, indicating that most of the wash and fluid used to kill the well had been removed. Additional tankage was started at once and executives of Superior made arrangements for pipe-line connections. The Empire Pipe Line Co. 10-in. line runs across the Stanolind Oil & Gas Co. and Amerada Petroleum Corp. lease to the south, while other purchasers are from 3 to 12 miles away.

Location for the test was made after many years of preliminary work. Considerable credit for the location was given to John L. Easley, chairman of the board of directors of Superior, who said that control for the new well was the old Washoma Petroleum Co. well in SW NW 15-22-1 (see map), which was drilled in 1929 to 4,863 ft., tested dry and was plugged back to Layton sand from which it has produced more than 70,000 bbl. The Faubian seemed to be on the nose of the high, and further control was the old Grady H. Vaughan 1 Lula, NE SE SW 16-22-1, which also went to the Wilcox at 4,790 ft., and was finally completed as a combination oil and gas well from the Layton.

The 1 Faubian had the first Wilcox sand at 4,729 ft., and the second sand at 4,880 ft. It was drilled to a total depth of 4,923 ft. (see below).

Wildcatting Continues Apace in All Areas; Wilcox Sought at Cushing

Wildcatting throughout the state held its fast pace last week. Since the first of the year, four major strikes have been made, not including last week's success at the old Otoe City pool, and a number of lesser discoveries in Hunton lime, Cromwell and Prue sands and Mississippi lime. As always, the most spectacular play was still for Wilcox production and last week Tide Water Associated Oil Co. announced that it would attempt to find Wilcox pay in an area of the old Cushing pool in Creek County. Progress of other tests is shown in the drilling report which includes more wildcats than the state has had in many a day.

In the Cushing pool, Tide Water was drilling cement plug at 2,485 ft. to deepen 8 Queen Victoria Jackson, NE SW SW 2-17-7, an old well which was first completed August 22, 1914, for 750 bbl. a day from the Bartlesville sand at a total depth of 2,582 ft. It has been producing for 27 years.

Of the four important discoveries—Tecumseh Lake, Guthrie, Velma (deep) and Apache—only two were in the first stages of development. They were Tecumseh Lake, where five producers have been drilled, and Guthrie, which also had five producers. Both pools were being tested by outposts, and both had outpost failures.

At Apache, Texas Co. was still having trouble with wild gas from the Hunton zone and had not been able to take a production test from the Simpson. Pending completion of the well, officials of the Texas Co. said they would withhold plans for a pipe-line outlet which would run from Apache through the Cement pool and on to Oklahoma City—a distance of some 74 miles (see Page 93). After dumping 6,000 sacks of cement, 16,050 sacks of various commercial muds, 1,100 bales of binder and 2½ tons of cotton-seed hulls into the hole, crews were still working around the well pouring cement and other preparations into crevices nearby. At Velma, Skelly Oil Co. was still testing the Simpson zone at 4 Robberson-Frensley.

Meantime, J. E. Crosbie, Inc., discoverer of the East Tecumseh Viola lime pool in Pottawatomie County, was staking two offsets in 16-9-4, after the state Corporation Commission ordered a 20-acre spacing pattern, and F. E. Harper and Roy J. Turner, discoverers of the East Edmond pool in northern Oklahoma County, obtained an order for 20-acre spacing while their offset well, 1 Houghin, NE SE 18-14-2w, had the sand at 5,884-85 ft. and had casing set.

SUMMARY OF COMPLETIONS

	No.	Bbl.	Footage
Oil wells: Fish	1	200	1,505
West Hewitt	1	216	2,265
Oklahoma City	2	1,135	13,124
St. Louis	1	15	4,288
Tecumseh Lake	1	140	5,260
Other fields	14	2,514	39,503
Wildcats	2	164	6,712
Gas wells: Fields	5	*221.8	16,884
Dry holes: Fish	1	.....	1,519
St. Louis	1	.....	4,549
Other fields	2	.....	3,639
Wildcats	3	.....	4,343
Total	34	.....	103,601
Recompletions	2	2,208	.....

*Million cu. ft.

WILDCAT COMPLETIONS

Caddo County: Ray Stephens 1 Pohlemann, NE NW 33-6-10w, pumped 64 bbl. oil in 10 hr., Noble Olson sand 3,362 ft., 9-in. 3,519 ft., T.D. 3,536 ft., P.B. 3,375 ft., shot 3,361-71 ft., *extends production west of Cement Pool.*

Okmulgee County: Vincent 1 West, SE SW NE 6-13-11, pumped 100 bbl., Misener 3,168 ft., T.D. 3,176 *of Cement pool.*

Pontotoc County: Heintzelman & Theodore 1 Crawford, NE NE NW 12-4-6, dry, T.D. 650 ft.

North American 1-A Mount, SE SW NW 13-4-6, dry, T.D. 425 ft.

Lincoln County: Portable 1 Scott, NW NW SE 31-17-4, dry, T.D. 3,268 ft.

FIELD COMPLETIONS

Avoca, Pottawatomie County: Atlantic 2 Spaugy-B, NW SE NW 6-6-4, flowed 315 bbl. pinched, Mayes 3,825 ft., Woodford 3,860 ft., Sylvan 4,076 ft., Viola 4,175 ft., Trenton 4,215 ft., Dense 4,235 ft., 5-in. 4,176 ft., T.D. 4,241 ft., acid.

Bald Hill, Okmulgee County: Neumayer 1-A Bay, S½ NW 24-14-14, 2 bbl., Booch 983-98 ft., T.D. 1,002 ft.

West Barnsdall, Osage County: Barnsdall 9 Osage, W½ W½ SE 11-24-10, 45 bbl., Bartlesville 1,876 ft., T.D. 1,929 ft.

Broken Arrow, Tulsa County: Betty Jane 1-A Bowers, SW SE NE 25-18-14, dry, T.D. 1,334 ft.

Burbank, Osage County: Magnolia 4 De Noya-B, SW NE NW 14-26-6, flowed 100 bbl., Burbank 2,838-2,913 ft., 6-in. 2,827 ft., T.D. 2,913 ft., shot 2,838-2,913 ft.

Castle, Okfuskee County: Portable 1 Replogle, NE SE SE 1-11-8, flowed 250 bbl. through 14/64-in. choke, Viola 4,092 ft., Dense 4,116 ft., dolomite 4,123 ft., 5-in. 4,146 ft., T.D. 4,148 ft., perf. 3,970-82 ft., acid.

Cement, Caddo County: Pace 3 Prentice, NE NW SW 6-5-9w, location abandoned.

Ohio 12 Wagner-2, S½ NW SW SW 12-5-9w, old well drilled deeper from 3,505 ft. to 4,218 ft., T.D., sand 3,807-36 ft., potential 2,068 bbl.

Chickasha, Grady County: Phillips 1 Dahl, SE SW 22-5-8w, 100,000,000 cu. ft. gas, pay 5,020-5,170 ft., T.D. 5,196 ft.

Oklahoma Natural 4 Chandler, SW NE 27-5-8w, 110,000,000 cu. ft. gas, Charlson zone 4,565 ft., T.D. 4,827 ft., 7-in. 4,821 ft., perf. 4,574-84 ft.

Coyle, Payne County: Texas 1 Burroughs, E½ NE NW 11-17-1, old well P.B. from 4,740 ft., perf. Misener and Hunton 4,675-4,725 ft., 60 bbl. oil and 75 bbl. water, P.B. 4,695 ft., acid, flowed 140 bbl.

Cushing, Lincoln County: Kemp 1 Kanady, NW SW SE 26-17-6, machine abandoned.

Dora, Seminole County: Eason 1 Huddleston, NE SE SW 3-6-6, 8,000,000 cu. ft. gas, Cromwell zone 2,704 ft., Cromwell 2,738 ft., T.D. 2,900 ft., 5-in. 2,895 ft., perf. 2,780-93 ft.

North Duncan, Stephens County: Lundy 1 Priddy, SW NW 24-1-9w, dry, T.D. 2,305 ft., stained sand 1,280-90 ft., water sand 1,860-90 ft., some oil and water 2,297-2,305 ft.

Fish, Seminole County: Cutsinger 1 Harjo, NW NE SW 19-7-8, dry, T.D. 1,519 ft., lower Calvin 1,514-19 ft., 7-in. 1,512 ft., show oil.

Mid-Continent 3 Fish, SE NE NW 19-7-8, pumped 200 bbl., lower Calvin 1,475-86 ft., 7-in. 1,477 ft., T.D. 1,505 ft., shot 1,495-1,505 ft.

West Hewitt, Carter County: Kyle 13 Dougherty, NE SW SW 17-4s-2w, potential 216 bbl., sand 2,213-65 ft., T.D. 2,265 ft.

Hickory Creek, Osage County: Bay 3 Osage, SE SE SW 34-29-11, 10 bbl., Wayside sand 875-930 ft., T.D. 935 ft.

Inola, Wagoner County: Blair 1 Robson, SE SE NE 20-19-16, location abandoned.

Keokuk, Pottawatomie County: Graham 1 Cossey, W½ SE SW 14-11-6, location abandoned.

Maud, Seminole County: Helmerich & Payne 1 School Land-B, NW SW SE 16-8-5, flowed 250 bbl., dense 4,195 ft., dolomite 4,230 ft., 7-in. 4,204 ft., Wilcox 4,258-63 ft., pumped 10 bbl. oil and 30 bbl. water, P.B. 4,140 ft., perf. 4,035-63 ft., acid.

South Maud, Pottawatomie County: Atlantic 3 Merkle, NE NW NE 32-8-5, pumped 357 bbl., Wilcox 4,353 ft., 7-in. 4,362 ft., perf. 4,362 and 4,354-60 ft., T.D. 4,362 ft., acid.

Norris (gas), Latimer County: Le Flore 42 Maxey, N½ SE 4-6-22, 750,000 cu. ft. gas, sand 1,635-1,731 ft., T.D. 1,874 ft., shot 1,665-1,731 ft., 8-in. 360 ft.

Oklahoma City, Oklahoma County: Phillips 1 Myrtle, NW SE NW 34-12-3w, pumped 690 bbl., Simpson 6,390 ft., 8-in. 6,426 ft., Wilcox 6,467 ft., shot 6,509-60 ft., T.D.

Phillips 1 Wadkins, NW NE NW 34-12-3w, pumped 445 bbl., 8-in. 6,432 ft., Wilcox 6,466 ft., shot 6,521-64 ft., T.D.

Pearsonia, Osage County: Stanolind 13 Osage, SW NW SE 18-27-8, 300 bbl., Mississippi chert 2,430-92 ft., T.D. 2,492 ft.

East Seminole, Seminole County: McIntyre 1 Daves, NE SW NE 14-9-7, flowed 7½ bbl. an hr., through ½-in. choke, Earlsboro 2,728 ft., Booch 3,213-36 ft., 7-in. 3,407 ft., T.D. 3,412 ft.

Slick, Creek County: Callahan 1 Kimble & Reading, NW NW SE 9-14-10, location abandoned.

St. Louis, Pottawatomie County: Smith 3 Bray, NE NW NW 5-7-4, dry, T.D. 4,549 ft., Wilcox 4,542 ft., cored white sand 4,542-45 ft.

A. Phillips 1 Smith, SW SE SW 31-7-4, 15 bbl. oil and 15 bbl. water, Viola 4,232 ft., 7-in. 4,232 ft., T.D. 4,288 ft., acid and shot 4,240-80 ft.

North St. Louis, Pottawatomie County: Amerada 1 Peters-A, NE NE SW 27-8-4, flowed 397 bbl., 1-in. choke, Woodford 3,830 ft., Hunton 3,846 ft., 7-in. 3,849 ft., T.D. 3,922 ft., acid.

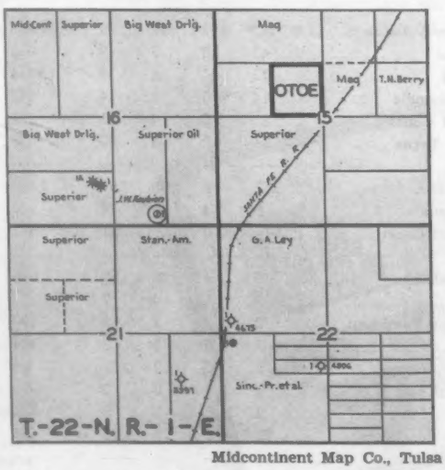
East Stroud, Creek County: Summit 1 Fisher, SW NW SE 32-15-7, flowed 300 bbl., Prue 2,778 ft., 7-in. 2,778 ft., T.D. 2,821 ft., shot 2,778-2,820 ft.

Tecumseh Lake, Pottawatomie County: Hall-Jordan 2 Whitehead, SW SE SW 36-10-3, pumped 140 bbl. oil and 15 bbl. water, Wilcox 5,242 ft., 7-in. 5,229 ft., T.D. 5,260 ft., P.B. 5,250 ft.

Tiger Flats, Okmulgee County: Wood 1-A McKinney, W½ W½ NE 13-12-12, 3,000,000 cu. ft. gas, first Dutcher 2,082 ft., T.D. 2,087 ft.

North Terlton, Pawnee County: Major 4 Moore, NE SW NE 12-20-7, pumped 40 bbl., Oswego 2,010-2,107 ft., Pink lime 2,305-12 ft., Bartlesville 2,415 ft., sand 2,621-23 ft., T.D.

Velma, Stephens County: Magnolia 28 Wilson, NE SW SE 1-2s-5w, pumped 8 bbl., sand 409-40 ft., 8-in. 409 ft., T.D. 440 ft., shot 424-40 ft.



Midcontinent Map Co., Tulsa

Otoe pool in Noble County, an old Layton sand producer, had Wilcox production last week at Superior 1 Faubian, circled above in SE SW SE 16-22-1. The well flowed at the rate of 40.5 bbl. an hour in early tests

WILDCAT DRILLING REPORT

North and Central

Creek County: Beal & LeVieux 1 Murray, SE SE SW 12-16-7, drilling 500 ft.

Mid-Continent 1 Louis Bear, SE SW SE 3-14-7, first Wilcox 3,972-74 ft., dry, second Wilcox 3,991 ft., cored 3,934-48 ft., 3,965-76 ft. and 3,976-88 ft., dry, cored salty sand and dolomite 3,988-93 ft., T.D. 3,993 ft., electrical log, P.B. 2,680 ft., to shoot.

Deep Rock 1 Lewis Meadvis, SE NW SE 16-15-7, first report.

Williams 7 Steinman, NE NW NW 17-16-10, drilling 1,600 ft.

Zephyr 1 Sinclair, SE SE NW 34-17-8, Hogshooter 1,295 ft., Layton 1,353 ft., Oswego 2,205-2,307 ft., Prue 2,325-90 ft., Redfork 2,693-2,732 ft., Inola 2,820 ft., Bartlesville 2,843 ft., Dutcher 3,100 ft., Mississippi 3,310 ft., T.D. 3,692 ft., set casing to test upper shows.

Garfield County: Gulf 1 Schroeder, N½ NE NW 8-23-4w, upper Layton 4,387 ft., lower Layton 4,588

(Continued on Page 118)

Two of Three Possible Pays Dry in Posey County Wildcat

By STAFF CORRESPONDENT

EVANSVILLE, Ind., June 23.—A prospective pool opener in Posey County, Whisenant & Trenchard 1 Florence McFadden, SW NW SW 16-6s-14w, proved somewhat disappointing last week. No. 1 McFadden, which encountered saturation in three formations, swabbed about 1 bbl. an hour when casing was perforated in the Renault lime at 2,784-90 ft. Operators next tested the Aux Vases sand which failed to show any oil. At the end of the week the well was being plugged back to test the Cypress with a shot.

Also disappointing last week was another Posey County wildcat, Kenneth Yost et al 1 Allyn, NW SE SW 14-7s-13w. Drilled through the McClosky to a total depth of 2,900 ft., it failed to find a show in any horizon.

SUMMARY OF COMPLETIONS

Indiana

	No.	Bbl.	Footage
Oil wells	4	535	8,515
Gas wells	3	*0.17	2,697
Dry holes	2	.....	4,552
Total	9	.....	15,764

Ohio

	No.	Bbl.	Footage
Oil wells	12	414	21,751
Gas wells	15	*6.7	35,269
Dry holes	13	.....	33,077
Total	40	.....	90,097
Recompletions	1	30	.....

*Million cu. ft.

Eastern Kentucky

	No.	Bbl.	Footage
Oil wells	6	60	6,300
Gas wells	7	*1.8	8,473
Dry holes	2	.....	3,000
Total	15	.....	17,773

Western Kentucky

	No.	Bbl.	Footage
Oil wells	3	107	3,126
Dry holes	6	.....	5,417
Total	9	.....	8,543
Input wells	2	.....	1,853

In the Caborn field of Marrs Township, Posey County, Paul Rossi has set casing to test 1 Dickhaut, SE SW NE 19-6s-12w. A 6-ft. core of the Cypress sand, topped at 2,354 ft., was described as carrying good saturation. Hole is bottomed in the pay.

KNOX COUNTY.—Dry through the McClosky at a total depth of 2,402 ft., was Kennedy & Hayes 1 Musselman, a Knox County wildcat 5 miles east of Mount Carmel. No shows were encountered in any horizon.

GIBSON COUNTY.—Illinois-Indiana Production Corp. 1 Stratman heirs, a Gibson County wildcat 2 miles east of Warrenton, was drilling ahead toward the McClosky at the end of the week. No. 1 Stratman heirs, SE NW NW 14-4s-10w, topped the Cypress at 1,835 ft. However, a test of this formation showed only water.

INDIANA COMPLETIONS

Wildcats

Blackford County: Harold Clamme 1 fee, NW NW NW 16-23n-11e, 10,000 cu. ft. gas, 10-qt. shot 945-65 ft., Trenton 945 ft., T.D. 965 ft.

La Porte County: Pet. Service 1 Turczynski, SW SW SE 22-37n-1w, location abandoned.

Monroe County: Terry Deskins 1 Thompson, NE NW SE 18-9n-1e, 10,000 cu. ft. gas, Devonian 788 ft., gas 815-20 ft., T.D. 820 ft.

Posey County: Less et al 1 Schrieber, NW SW SW 24-6s-13w, dry at 2,507 ft., Glen Dean 2,231 ft., Cypress 2,494 ft., water 2,507 ft.

Vigo County: Wooters 1 Ellsworth, SW NE NE 16-12n-10w, dry at 2,045 ft.

Fields

Burkin, Posey County: Hollandsworth 1 Egli, NE NE SW 19-6s-12w, pumped 60 bbl., Cypress pay 2,350-68 ft., T.D. 2,368 ft.

Griffin, Gibson County: Hall Edwards 33-A Maier, NW NW NE 14-3s-14w, flowed 400 bbl., 80-qt. shot 2,524-65 ft., T.D. 2,565 ft.

South Griffin, Gibson County: Continental 41 Bozeman, NE NE NW 26-3s-14w, pumped 72 bbl., 60-qt. shot 2,760-98 ft., T.D. 2,798 ft.

Trenton, Decatur County: Hoosier 224 Beerkamp, SE SE 15-9n-9e, 145,000 cu. ft. gas, 140-qt. shot 781-912 ft., Trenton 871 ft., T.D. 912 ft.

Troy, Spencer County: I. A. Paulhamus 1 Grass, SW NE SE 11-6s-4w, pumped 3 bbl., 40-qt. shot 763-80 ft., T.D. 784 ft.

INDIANA DRILLING REPORT

Daviess County: J. W. Cannon 1 Walker, N½ SE SE NE 5-2n-5w, drilling 460 ft.

Swartzentruber et al 1 Beck, SE SW NE 8-2n-5w, drilling 175 ft.

Gibson County: Ill.-Ind. Prod. 1 Stratman, NW NW 14-4s-10w, Menard 1,320 ft., Glen Dean 1,535 ft., tools twisted off at 1,629 ft., S.D.

Yingling & Hayes 1 Kieffer, S½ SW SE 26-1s-12w, first report, 10-in. 125 ft., waiting on cement.

Ward Wickwire et al 1 Tennes, SW SE SW 8-2s-12w, Kincaid 1,665 ft., Menard 1,740 ft., Glen Dean 1,970 ft., Hardinsburg 2,000 ft., Golconda 2,055 ft., Barlow 2,173 ft., sand 2,187-2,209 ft., water, Benoist 2,315 ft., Renault 2,425 ft., drilling 2,460 ft.

Jasper County: A. Thomas et al 1 Davidson, SW NE SW 25-30n-7w, first report, Devonian 90 ft., 5-in. 100 ft., Trenton 953 ft., drilling 1,035 ft.

A. A. Douglas et al 1 Horton, SE NE NE 1-29n-5w, first report, Silurian 5 ft., Medina 425 ft., show oil 625-39 ft., Trenton 895 ft., show oil 905-50 ft., T.D. 1,102 ft., will rig up standard tools and test.

Knox County: Lloyd E. Kennedy 1 Musselman, NE NW SW 34-1n-12w, Menard 1,545 ft., Waltersburg sand 1,578 ft., Tar Springs 1,682 ft., Glen Dean 1,766 ft., Barlow 1,950 ft., drilling 1,950 ft.

Monroe County: Terry Deskins 1 Cowling, SW SW NW 34-7n-1e, set 6-in. 1,740 ft., show oil 1,744-70 ft., drilling 1,790 ft.

Posey County: Yost et al 1 Allyn, NW SE SW 14-7s-13w, Kincaid 1,480 ft., Clore 1,600 ft., Menard 1,790 ft., Glen Dean 2,085 ft., Barlow 2,337 ft., Cypress 2,390 ft., water, drilling 2,410 ft.

Mahutska Oil 1 Elliott, SW NW NW 5-4s-13w, T.D. 2,653 ft., P.B. 2,490 ft., 20-qt. shot 2,483-89 ft., cleaning out.

OHIO FIELDS

NEWARK, Ohio, June 23.—Ohio completions were on the increase this week and were scattered over a wide area. Activity in the Newark field continues with Berea oil and Clinton gas completions. Perry County yielded a 250-bbl. oil well. Muskingum County reported a fair gasser.

Oriskany test in Washington County was plugged at 4,651 ft. as a dry hole.

Ohio Oil Co. test in Saybrook Township, Ashtabula County, is drilling ahead at 1,750 ft.

Ashland County

Jackson Township: Ohio Fuel 1 Lawrence Franks, Sec. 22, dry, Clinton, T.D. 2,974 ft.

Athens County

Canaan Township: Ross et al 1 Eliza Hill, Sec. 13, 500,000 cu. ft. gas, first Berea, T.D. 1,456 ft.

C. W. Nuzum 1 B. K. Morris, Sec. 7, 170,000 cu. ft. gas, shot, second Berea, T.D. 1,541 ft.

Carthage Township: Ohio Fuel 1 M. Koehler, near Alfred, Sec. 25, 15 bbl., first Berea, T.D. 1,634 ft.

Allen County

Bath Township: Old Fort Oil Co. 7 Jeson Rumbaugh, Sec. 14, 5 bbl., Trenton shot, T.D. 1,377 ft.

Belmont County

Union Township: Wiser Oil Co. 1 N. E. Moore, Sec. 31, dry, Maxon, T.D. 901 ft.

Columbiana County

Yellow Creek Township: C. S. Peters et al 6 William McDonald, SE Sec. 11, 1½ bbl., Berea, T.D. 852 ft.

Cuyahoga County

Independence Township: Hajeck et al 1 Foder Realty Co., Seven Hills Village, 290,000 cu. ft. gas, Newburg, T.D. 2,760 ft.

Fairfield County

Berne Township: City Natural 1 S. Renshaw, Sec. 3, 30,000 cu. ft. gas, Clinton, T.D. 2,202 ft.

Guernsey County

Valley Township: Jewell Co. 1 Paul Saribok, Sec. 14, 90,000 cu. ft. gas, Berea, T.D. 1,178 ft.

Hardin County

Marion Township: Bosse & Abbot 1 Zera Shadley, Sec. 10, 5 bbl., shot, Trenton, T.D. 1,414 ft.

Hancock County

Blanchard Township: Williams & Moore 1 Kate Turley, Sec. 27, 4 bbl., shot, Trenton, T.D. 1,370 ft.

Knox County

Butler Township: Upham 1 J. C. Staats, ffrst quarter, dry, T.D. 2,895 ft.

Union Township: Ohio Fuel 1 Cath. Wander, Sec. 5, dry, T.D. 2,905 ft.

Ohio Fuel 2 Eliz. Miller, Sec. 18, dry, Clinton, T.D. 2,997 ft.

J. B. Reed 1 Ralph Blubaugh, NW Sec. 5, dry, Clinton sand, T.D. 2,905 ft.

Lawrence County

Windsor Township: Petri & Noomen 1 G. McMahan, Sec. 33, 170,000 cu. ft. gas, shot, Ohio shales, T.D. 3,059 ft.

Licking County

Fallsbury Township: McClay Bros. 8 W. G. Porter, Sec. 13, 32 bbl., shot, Clinton, T.D. 3,016 ft.

Mary Ann Township: Settles Oil 3 H. O. Thompson, fourth quarter, 12 bbl., shot, Berea, T.D. 605 ft.

Hoover Bros. 4 Robert Ridenour, fourth quarter, 11 bbl., shot, Berea, T.D. 597 ft.

Madison Township: Ohio Fuel 1 L. P. Miles, Lot 11, 950,000 cu. ft. gas, Clinton, T.D. 2,558 ft.

Newark Township: Ohio Fuel 2 M. Van Tassel, first quarter, 300,000 cu. ft. gas, Clinton, T.D. 2,405 ft.

National Gas 1 Charles Miller, first quarter, 50,000 cu. ft. gas, plugged, Clinton, T.D. 2,410 ft.

Shuff & Bucy 1 H. T. Wright, township limits, 900,000 cu. ft. gas, Clinton sand, T.D. 2,440 ft.

Newton Township: George Penick 1 George Eshelman, Sec. 2, 554,000 cu. ft. gas, Clinton sand, T.D. 2,700 ft.

Perry Township: McClay Bros. 1 Charles W. Martin, Sec. 3, 30 bbl., Clinton sand, T.D. 2,816 ft. This was a former gas well completed in 1931 and now deepened through the Clinton sand finding the oil pay.

Lorain County

Columbia Township: Ohio Fuel 1 Straub & Wise, Lot 55, 134,000 cu. ft. gas, shot, Clinton, T.D. 2,773 ft.

Medina County

Chatham Township: Preston Oil 2 Charles Young, Lot 4, dry, Berea, T.D. 522 ft.

Meigs County

Orange Township: Cooper-Lamp 1 Charles Betzing, Sec. 15, 50,000 cu. ft. gas, stray, T.D. 1,250 ft.

Muskingum County

Harrison Township: Pure Oil 1 Alva Shetrone, Sec. 11, 2,250,000 cu. ft. gas, Clinton, T.D. 4,002 ft.

Newton Township: Preston Oil 2 Emma Ford, Sec. 11, 41 bbl., shot, Clinton, T.D. 3,452 ft.

Wayne Township: Atha Realty 3 Jos. Ellerman, Sec. 14, dry, through Medina, T.D. 4,075 ft.

Noble County

Sharon Township: John Cisler 3 Clifford T. Marquis, NE Sec. 7, dry, Macksburg 800-ft. sand, T.D. 900 ft., no showing of oil or gas.

Perry County

Clayton Township: Pure Oil Co. 1 F. E. Smithley, NE Sec. 8, 35 bbl. and 1,000,000 cu. ft. gas, Clinton sand, T.D. 3,310 ft.

Preston Oil 1 Mary Yarger, Sec. 4, 250 bbl., shot, Clinton 3,314-68 ft., T.D. 3,373 ft.

Washington County

Barlow Township: Ohio Fuel 1 J. W. Orimston, Sec. 11, 25,000 cu. ft. gas, shot, Berea, T.D. 1,843 ft.

Liberty Township: Triple Oil & Gas Co. 1 Sarah M. Hall, NE Sec. 4, 1½-bbl. pumper, second Cow Run sand, T.D. 751 ft.

Warren Township: Charles Ross et al 1 Charles Ammon, Sec. 29, dry, no Oriskany, Onondaga top 4,400 ft., T.D. 4,651 ft.

Wayne County

Chester Township: Harmon 1 Ben Fair, Sec. 31, 200,000 cu. ft. gas, Newburg (Clinton, dry), T.D. 3,102 ft.

Plain Township: Ohio Fuel 1 Howard Wilson, Sec. 32, dry, Clinton, T.D. 3,032 ft.

Wyandot County

Richland Township: Pure Oil 1 Judge Kear, Sec. 13, dry, sub-Trenton, T.D. 1,910 ft.

EASTERN KENTUCKY

ASHLAND, Ky., June 23.—A report received here tells of a wildcat completion in Menifee County with the well making 10 bbl. of oil per hour. The report, received from reliable sources, says the well was drilled in on the Sarah Montgomery farm but depth and information are not available. Earl Prater is the operator.

Six other oil wells were completed in eastern Kentucky this week and three gas wells, one an excellent producer, were drilled in. Field reports show that two other wells were completed as dry holes. The six oil wells have a combined daily production of 60 bbl., while the gas wells show a combined daily flow of 1,770,000 cu. ft. of gas.

The Kentucky-West Virginia Gas Co. reports making locations for eight more wells, as a part of an expansive drilling program announced several months ago. This firm is now drilling 32 wells and is either moving to or rigging up at six locations as well as having several other locations made.

The Warfield Natural Gas Co. is drilling deeper for gas in No. 2 on the Parsley farm on Black Log Fork after the sand broke up. The well is down 1,125 ft.

COMPLETIONS

South Fork district, Powell County: Evans Oil & Gas Co. 4 B. F. Creech, on Millers Creek, 15 bbl.

Wireman Bros. 1 M. V. Wireman, dry.

Price Fraley 1 McQuinn heirs, on Millers Creek, 15 bbl.

Price Fraley 2 McQuinn heirs, 5 bbl.

(Continued on Page 113)

Second Mississippian Lime Test in Young Co. Flows

By R. MARNE SANFORD

WICHITA FALLS, Tex., June 23.—A new Mississippian lime producing spot has been opened in Young County and along the trend northwest of the Burns 1-A Larrimore, last month's discovery, which started the exploratory play to the 4,800-4,900-ft. lime zone. The new strike is T. D. Humphrey 1 E. G. Williamson, located 1,537 ft. from the north and 330 ft. from the east lines of Section 601, T.E.&L. Survey. It is about 1¾ miles southwest of the town of Jean and 5½ miles southeast of the Burns strike on the Larrimore lands. It is on the northwest-southeast trend which has been actively leased during the past month.

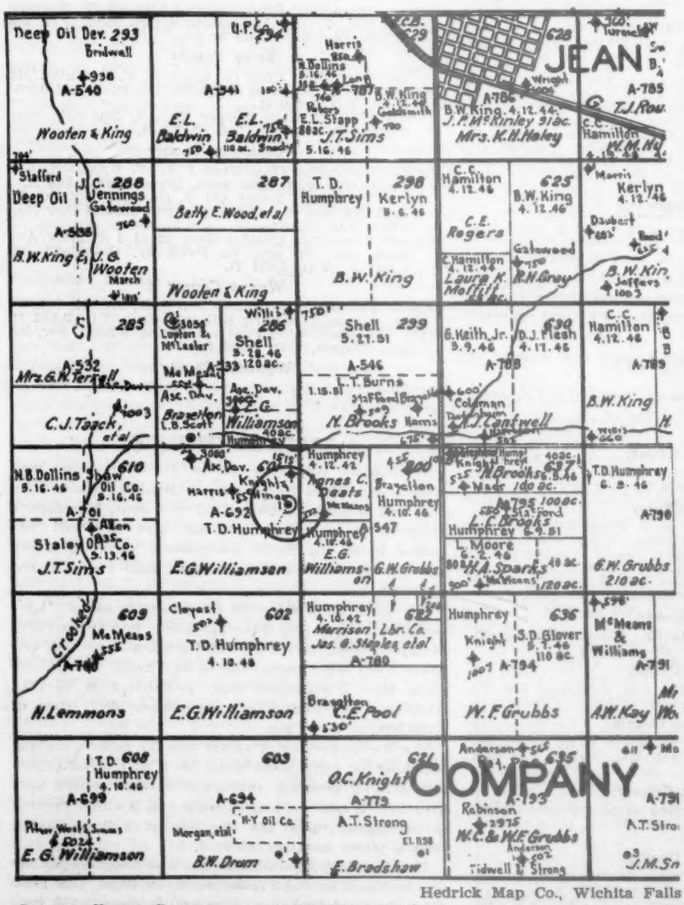
No. 1 Williamson found the top of the Caddo at 3,985 ft., the Mississippian at 4,980 ft., and the Ellenburger lime at 5,152 ft. It was drilled to a total depth of 5,246 ft. and plugged back to casing seat at 5,084 ft. The Mississippian section was perforated from 4,983 to 5,009 ft., and from 5,015-33 ft. and treated with 2,000 gal. of acid. The well kicked off to flow 35 bbl. of 44.6-gravity oil in 24 minutes through open tubing. No water was present in the initial flow following the acid treatment, however, subsequent testing during the week indicated the presence of water in the lower part of the section and at last reports operators were performing a squeeze job on the lower few feet of perforations.

With the official completion of this discovery will come an even more intense drilling program for the several intervening miles between the two deep Mississippian strikes. Already several of the outpost tests to the Burns discovery have reached the prospective pay, some finding production and some even failing to find the Mississippian lime zone.

Several tests were holding attention at the close of the week. Plugging orders were given the L. T. Burns 1 Dahse, Block 18, Crawford subdivision of the Holeman Survey, wildcat which went to 5,163 ft. and found the Mississippian lime barren.

The Shell 1-A Bloodworth, Section 151, ½ mile north of the Burns strike, plugged back to 5,020 ft. and perforated at 4,135 ft., recovering 20 gal. of brackish water. It is being plugged back again to test the upper part of the Caddo lime. The hole was drilled to the Ellenburger lime which tested dry as did the overlying Mississippian.

Ray and Consolidated Oil 1 Dunagan, Section 163, T.E.&L. Survey, has set casing at 4,900 ft. after bottoming hole at 4,949 ft. in the Mississippian lime zone which showed some chances for production. This well is about a mile west and slightly north of the Burns discovery on the Larrimore lands. Should the Mississippian fail to produce the hole will be carried to the Ellenburger zone.



Hedrick Map Co., Wichita Falls

Opening Young County's second Mississippian lime producing spot in as many months is the T. D. Humphrey 1 Williamson, Section 601, T.E.&L. Survey, about 1½ miles southwest of Jean and some 5½ miles southeast of the recent Burns 1 Larrimore strike. The new well was started following exploration resulting from the first discovery. Saturation in 1 Williamson was found in broken sections from 4,983 to 5,033 ft. On preliminary gage after acid treatment it flowed 35 bbl. of oil in 24 minutes

Another Pay Level for Prolific K.M.A. Area

Despite the fact that it is being deepened, a test in the K.M.A. field of Wichita County has definitely indicated the discovery of another producing horizon. It is Consolidated Oil 28 Ferguson, Lot 7, W. H. Spillers Survey, in the heart of the recently opened Ellenburger section of the field. It topped the Caddo lime at 3,860 ft. and drilled saturation from 3,864 to 3,905 ft., total depth. A drill-stem test recovered 360 ft. of oil and oil-cut mud with a blow of gas. The bottom-hole pressure registered 1,750 lb. It is going ahead toward the Ellenburger lime but will be plugged back should the lower zone fail. The lease under this test is producing from the K.M.A. zone, the Ellenburger lime zone, and numerous shallow levels developed some 20 years ago and now semidepleted. This is the first test to find saturation in the Caddo lime, however, the Caddo level opened at Hull-Silk to the south later proved almost as prolific as the first-discovered lower Strawn zone.

SUMMARY OF COMPLETIONS

North Texas

	No.	Bbl.	Footage
Oil wells: Hull-Silk	2	222	6,369
Voth	3	91	4,244
K.M.A.	8	2,105	33,603
Olney	6	235	4,734
Other fields	5	1,625	14,392
Miscellaneous fields	17	2,772	35,351
Wildcats	1	63	3,007
Dry holes: Olney	4	.....	3,702
Other fields	3	.....	7,863
Miscellaneous fields	4	.....	5,475
Total	53	.....	118,740

West Central Texas

	No.	Bbl.	Footage
Oil wells: Fields	1	18	3,458
Gas wells: Fields	2	*3.9	2,679
Wildcats	1	*4.0	2,955
Dry holes: Fields	2	.....	8,797
Wildcats	4	.....	4,988
Total	10	.....	22,877

*Million cu. ft.

Cooke Wildcat Gets Shows

A Cooke County wildcat showed for a new discovery at the close of the week. It was Harvey Drilling Co. 1 John and H. P. Ware, located 330 ft. from the east and 660 ft. from the south lines of a 68-acre tract in the W. M. Crisp Survey, 5½ miles east of Gainesville and about 2,400 ft. southeast of a previously abandoned test which showed some oil in the new test's prospective pay zone. No. 1 Ware was tested at 2,211-22 ft. with formation tester and in 30 minutes it showed a recovery of 60 ft. of oil and 50 ft. of mud. The sand, topped at 2,217 ft., has been identified as the Bruhlmeyer sand. Casing has been set for production attempts early the coming week.

NORTH TEXAS COMPLETIONS

Wildcats

Wilbarger County: Magnolia 65 Waggoner (old well drilled deeper), 63 bbl., ⅛-in. choke, top Ellenburger 2,993 ft., old T.D. 779 ft., new T.D. 3,007 ft., perf. casing 2,993-96 ft.

Fields

Antelope, Clay County: Shell Oil 3 Mullens, 228 bbl. in 8 hr., 2-in. casing outlet, est. 500 bbl. daily, 3,176-3,208 ft., P.B. to 3,232 ft., T.D. 3,208 ft.

Fargo, Wilbarger County: Amerada Pet. 2 Dodson B, 152 bbl. in 3 hr., ½-in. choke, est. 750 bbl. daily, 3,993-4,019 ft., T.D. 4,027 ft.

Hull-Silk, Archer County: J. A. Chapman 4 Wilson A, 42 bbl. in 2 hr., 40-qt. shot 3,783-93 ft., est. 150 bbl. daily, P.B. to 3,744 ft., T.D. 3,816 ft.

Roeser & Pendleton 2 Parkey, dry at 4,705 ft.

Sinclair Prairie 1 Tuberville, 72 bbl. oil and 130 bbl. water in 24 hr., pumping, 1,500 gal. acid 2,551-53 ft.

K.M.A., Wichita County: Mitchell Oil 4 Mitchell, 26 bbl. in 3 hr., ⅝-in. choke, est. 96 bbl. daily, 20-qt. shot 3,819-59 ft.

D. M. Ross 29 Mitchell, 49 bbl., ⅛-in. choke, 240-qt. shot 3,832-73 ft., P.B. to 3,877 ft., T.D. 3,881 ft.

High Point Oil 2 Barnett A, 65 bbl. in 3 hr., ¾-in. choke, 430-qt. shot, est. 225 bbl. daily, 4,110-51 ft.

Hammon Hanlon-Buchanan 40 Fassett & Tuttle, 63 bbl. in 3 hr., 25/64-in. choke, est. 225 bbl. daily, 150-qt. shot 4,012-52 ft., P.B. 4,055 ft., T.D. 4,067 ft.

Hammon Hanlon-Buchanan 4-A Fassett & Tuttle, dry at 1,400 ft.

Consolidated Oil 30 Ferguson, 70 bbl. in 3 hr., ¾-in. choke, est. 275 bbl. daily, top Ellenburger lime 4,199 ft., K.M.A. 3,654 ft., pay 1,802-09 ft., T.D. 4,324 ft.

Tide Water and Perkins & Cullum 2 State-Pettit, 103 bbl. in 3 hr., ¼-in. choke, est. 650 bbl. daily, top K.M.A. lime 3,790 ft., pay 4,410-22 ft.

Dorian & Barnes 2 E. M. Barnes B, 10 bbl., pumping, 4,000 gal. acid, top Ellenburger lime 4,375 ft., pay 4,308-16 ft., T.D. 4,501 ft., P.B. to 4,316 ft.

Shell Oil 25 N. C. Griffin, 168 bbl. in 3 hr., ¾-in. choke, est. 575 bbl. daily, top K.M.A. 3,726 ft., Ellenburger 4,331 ft., pay 4,331-96 ft.

Nocona, Montague County: Dan Hughes 1 Crow, 50 bbl., 5-qt. shot 811-16 ft., T.D. 825 ft.

Olney field, Young County: Sams & Prideaux 7 Prideaux, dry at 679 ft.

Bohner & Watson 16 Prideaux, 4 bbl., pumping, 554-59 ft., T.D. 569 ft.

3,505 ft., recemented surface pipe.

Hill & Hill 1 Kinder, 467 ft. from E and 150 ft. from S, B.S.&F. Sur., Abst. 2351, 2,300-ft. cable-tool test, location.

W. H. Carter 1 L. W. Carney, 2,256 ft. from N and 467 ft. from E lines John D. Rogers Sur., Abst. 501, drilling 1,875 ft.

Reed & Croft 1 Richards, 467 ft. from W and 1,200 ft. from N lines C. Gates Sur., Abst. 237, 3,500-ft. test, cellar and pits.

Alma Oil 1 Maxey, W. W. Maxey Sur., top Marble Falls 4,830 ft., drilling at 4,903 ft.

Montague County: Walter H. Cant 1 Will Laird, 467 ft. from S and E lines of SW cor. F. Cook Sur. A-139, P.B. to 6,590 ft., pumped 30 bbl. in 9 hr., testing on pump.

Superior Oil 1 Wilmer Seay "A," 330 ft. from S and W lines H. B. Morton Sur. A-1175, 5,700-ft. rotary test.

Throckmorton County: Rathke Oil 1 Swagerty, 495 ft.

from N and 746 ft. from E lines of SW Sec. 258, B.B.B.&C. Sur., top Mississippian 5,019 ft., prep. to run 5½-in. casing 5,020 ft.

Jack Bell 1 Putman, 600 ft. W of river and 150 ft. from S line Sec. 25, Comanche Indian Reserve A-884, pulled casing 900 ft., prep. to deepen.

Jimmie Rogers 1 Timmons, NW cor. S½ Sec. 2189, T.E.&L. Sur., 4,200-ft. test, drilling below 1,130 ft. choke, est. 160 bbl. daily, 1,798-1,801 ft.

Young County: Lion Oil 2 King & Wooten, 264 bbl. in 8 hr., est. 500 bbl. daily, top Caddo lime 3,703 ft., 3,708-15 ft.

McLester & Lupton 2 Choate (old well drilled deeper), 7 bbl., pumping, top Marble Falls lime 4,063 ft., 30-qt. shot 3,636 ft., T.D. 4,107 ft.

NORTH TEXAS ACTIVE WILDCATS

Archer County: W. B. Hamilton 22 Cartwright, 660 ft. from W and S lines, James Webb Sur., Abst. 664, T.D. 5,211 ft., P.B. 5,164 ft., putting on pump.

C. L. Shiver 1 Claude Cowan, 130 ft. from N and E lines of SE Sec. 28, Jefferson Co. School Lands Sur., Abst. 240, drilling 340 ft.

C. W. Snoddy 1 Carter, SE cor. N 60 acres of W 120 acres of Sec. 38, Clark and Plumb subd., 1,400-ft. test, shut down 1,125 ft.

Clay County: Bridwell Oil 1 Myers (old well drilling deeper), Charleton Thompson Sur., Abst. 444, top Mississippian 5,997 ft., old T.D. 6,065 ft., derrick to drill deeper.

Bridwell Oil 2 Myers, 3,350 ft. from W and 2,185 ft. from N lines, Thompson Sur., Abst. 444, 6,000-ft. test, T.D. 6,098 ft., perf. casing 60 shots 5,776-92 ft., 3,000 gal. acid, testing.

Gulf 1 C. W. Scaling, NW NW Sec. 31, T.&N.O. Sur., Abst. 685, 6,000-ft. test, flowed 88 bbl. oil and 16 bbl. water in 8 hr., testing at 5,814 ft.

Cooke County: C. J. Bohner 1 Wickliff, 330 ft. from S and W lines, NE cor. S 40.45 acres of W 80.9 acres of E 182.69 acres, Israel Gable Sur. A-420, rigging up spudder.

Harvey Drilling Co. 1 J. W. & H. P. Ware, 330 ft. from E and 600 ft. from S lines, W. W. Crisp Sur. A-221, drilling 1,525 ft.

Moss Holmes 1 E. F. Coffee, 1,340 ft. from S and 150 ft. from W lines Z. P. Tipton Sur. A-1608, 1,950-ft. test.

Grayson County: R. W. Talbot 1 Jewell, SW cor. 159-acre tract in William Allen Sur., Abst. 15, drilling 6,044 ft.

Jack County: F. Kirk Johnson 1 E. J. Shawyer, 660 ft. from S and 530 ft. from E lines of NW SE, J. Turner Sur., Abst. 609, 5,500-ft. test, underreaming 12½-in. casing at 945 ft.

O. J. Perrin 1 Brumbelow, 1,045 ft. from S and 720 ft. from E lines, H. C. Ayers Sur., Abst. 4, T.D. bbl. daily 4,761-84 ft.

MISCELLANEOUS

Archer County: Henry Grace 4 L. F. Wilson, dry at 1,587 ft.

Henry Grace 5 L. F. Wilson, dry at 1,565 ft.

Shell Oil 1 W. M. Coleman C, 305 bbl. in 4 hr., 3,000 gal. acid, est. 850 bbl. daily, top Caddo 5,052 ft., pay 5,060-5,157 ft.

Petroleum Prod. 7 Roy King, 306 bbl., pumping 1,220-40 ft.

Petroleum Prod. 8 Roy King, 264 bbl., pumping, 1,218-44 ft.

Morgan & Turner 7-A Andrews, 31 bbl., pumping, 4,103-15 ft.

Gable Oil 20-S Webb, abandoned location.

Petroleum Prod. 4 Anna Koester, dry at 1,181 ft.

Petroleum Prod. 5 Anna Koester, dry at 1,142 ft.

Clay County: Perkins & Cullum 6 Taylor A, 60 bbl., pumping natural, 1,110-21 ft.

A. P. Kouri 1 Cheeves, 110 bbl., pumping natural, 1,128-41 ft.

George W. Graham 6 Hansard, 12 bbl., pumping, 1,137-41 ft.

Stayton Oil 7 McGregor, 25 bbl., pumping, 1,168-79 ft.

J. M. Tanner 16 Rigsby, 4 bbl., pumping, 212-24 ft.

Wichita County: Akin, Dimock & Costley 3 Dodson A, 25 bbl., pumping 1,312-29 ft.

Hanlon-Buchanan 3 Burnett A, 10 bbl., pumping, 715-22 ft.

Wilbarger County: George T. Davis 3 Waggoner, 8 bbl., pumping, 1,547-60 ft.

Waggoner Ref. 7 Waggoner, 72 bbl. in 3 hr., ¼-in. choke, est. 275 bbl. daily, 3,000 gal. acid 3,740-70 ft.

J. A. Wood 2 Mary Womack D, 40 bbl. in 8 hr., ¾-in. choke, est. 125 bbl. daily, 1,778-83 ft.

J. A. Wood 4-D Womack, 43 bbl. in 8 hr., ¾-in.

Bohner & Gilmore 9 Prideaux A, 5 bbl., pumping, 564-74 ft.

W. F. Palmer 3 Marshall, 26 bbl., pumping, 900-08 ft.

W. F. Palmer 4 Marshall, dry at 970 ft.

W. F. Palmer 2 Marshall B, 30 bbl. in 12 hr., est. 50 bbl. daily, 901-11 ft.

G. J. Scholl 1 Howard, dry at 893 ft.

N. H. Martin & Son 1 Hunt, dry at 1,160 ft.

L. T. Burns 11 Bloodworth, 95 bbl., pumping, 873-86 ft.

L. T. Burns 4 Leberman, 55 bbl., pumping, 884-88 ft.

Rogers & Rogers, Montague County: Stanolind Oil 2 Dodson, 68½ bbl. in 3 hr., est. 150 bbl. daily 1,532-49 ft.

Voth, Cooke County: Kingery Bros. 5 Trubenbach, 30 bbl., 30-qt. shot 1,627-44 ft.

Humble Oil 15 Hellman, 28 bbl. in 8 hr., pumping natural, est. 55 bbl. daily, 1,287-1,303 ft.

Humble Oil 1 Angelina Kleiss, 6 bbl., pumping, 20-qt. shot 1,285-97 ft.

Humble Oil 2 Angelina Kleiss, dry at 1,758 ft.

Walnut Bend, Cooke County: Sinclair Prairie 10 Ramsey, 100 bbl. in 10 hr., pumping natural, est. 175

Helmerich & Payne 1 Housley, 660 ft. from S and E lines Sec. 300, B.B.B.&C. Sur., 4,200-ft. rotary test.

Wichita County: King Oil and Perkins & Cullum 1 Wells, 2,353 ft. from W and 4,230 ft. from N lines, Lot 23, J. A. Ventross Sur., Abst. 103, 5,000-ft. test, drilled saturation in K.M.A. lime, swabbed and cleaned out, est. 5 bbl. per hr. 4,065 ft.

E. C. Harlin, Jr. and Tom Medders 1 J. B. L. Hansard, 150 ft. from W and 774.6 ft. from S lines of Blk. 38, Specht & McCutcheon subd., H. C. Taylor Sur. A-285, 1,350-ft. rotary test.

Northern Drilling Co. 1 J. E. Roller, 1,000 ft. from W and 750 ft. from N lines C.T.R.R. Co. Sur. A-438, 450-ft. cable test.

Wilbarger County: O. H. Hammer 1 A. V. Shelton, NW NW Sec. 16, Blk. 11, H.&T.C. Sur., 4,500-ft. test, fishing for drill stem 780 ft.

Young County: F. H. D. Co. and Fliming-Kimbell Corp. 1 Graham, SE cor. Sec. 2912, T.E.&L. Sur., 5,000-ft. test, top Marble Falls 4,260 ft., drilling 4,306 ft.

L. T. Burns 1 Dashe, SE cor. Sec. 18, I. Holeman Sur., Abst. 160, 5,500-ft. test, top Caddo 4,494 ft., show oil, drilling 4,960 ft.

Consolidated Oil 1 Dunigan, 467 ft. from S and E lines Sec. 163, T.E.&L. Sur., 5,000-ft. test, top Mississippian 4,898 ft., fishing at 4,949 ft.

Shell 1-A Bloodworth, Sec. 151, T.E.&L. Sur., 6,200-ft. test, top Ellenburger 5,038 ft., show oil, shut down at 5,100 ft. for swabbing unit.

T. D. Humphrey 1 Williamson, 1,537 ft. from N and 330 ft. from E lines Sec. 601, T.E.&L. Sur., drilling at 5,246 ft.

R. P. Dorian 1 Daniels, 330 ft. from S and W lines Sec. 421, T.E.&L. Sur., 6,000-ft. test, drilling 2,780 ft.

Wrightsman Oil 1 Gilmore, 2,107 ft. from NE and 1,960 ft. from SE Sec. 3, B.B.B.&C. Sur., 2,600-ft. rotary test, drilling 1,412 ft.

Tom B. Medders 1 J. W. Daws, 933 ft. from N, E, S. and W lines of NW¼ of T.E.&L. Sur. 750, 5,500-ft. test.

Three Wildcats Started in Wimberly Area, Jones County

FORT WORTH, Tex., June 23.—Increasing activity in the Wimberly area in southwestern Jones County was seen at the close of the week with the location of three wildcats in that district. The W. D. Brookover & Lee 1 Church, a west offset to the discovery well, has been completed and is estimated good for 500 bbl. daily from the second pay horizon encountered.

Extension of the activity into northern Taylor County appears probable. Lewis Production Co. has staked a wildcat 6 miles southwest of the Wimberly pool as 2 J. T. Henslee. The test is 5 miles east of Merkel in Taylor County and 2,000 ft. east of a previous test. A second project in this same county is the W. H. Peckman 1 Buel Perry, 4½ miles south of the Wimberly area.

A third outpost 7½ miles west of the Wimberly pool in southwestern Jones County is the J. L. McMahor et al 1 George Miller,. in Lot 13, C. P. Warren Subdivision 56, DeWitt County School Lands Survey. This test is drilling below 2,646 ft.

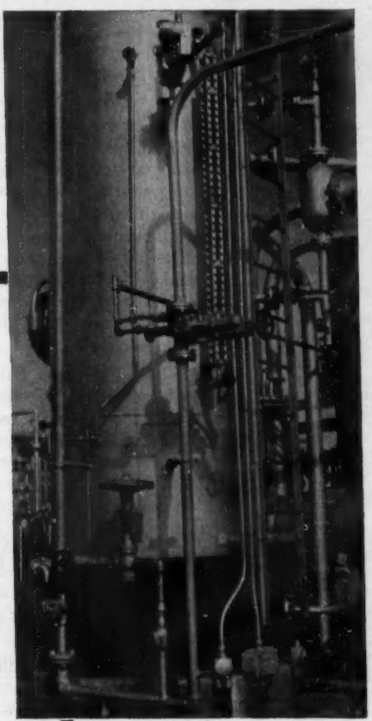
Discovery East of Noodle Creek Is Gaged

Completion of a small discovery well just east of

(Continued on Page 124)

JERGUSON

REFLEX GAGE



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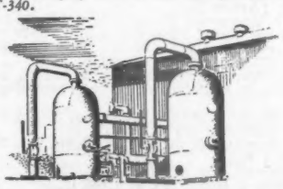

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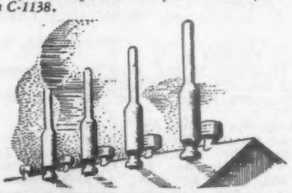

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Production Up to Pipe-Line Capacity; Davidson Extended

By ROBERT INGRAM

KANSAS production last week reached a new all-time high with a total of 231,450 bbl. daily average reported for the week. It was the most important increase in daily average runs for several weeks and came so close to the state's total pipe-line capacity that there was doubt whether the trend could continue upward until more outlets were completed.

Operators continued drilling new wells, however, as relief was already in sight. Two weeks ago Gov. Payne Ratner announced at Topeka that plans had already been made to increase the state's pipe-line capacity to about 275,000 bbl. a day through a number of projects (The Oil and Gas Journal, June 19, 1941), and work was expected to begin at once.

While drilling operations were not entirely confined to producing areas, Phillips, Thomas and Kearny counties had the only really rank wildcats. The Phillips County play was centered on Cities Service Ray pool which had another high-potential well last week (see completions) and during April produced a total of 10,277 bbl. from nine wells. In Kearny County, Stanolind Oil & Gas Co. was drilling its third test in the area and in Thomas County, Alva Billings 1 Ryan, E½ NE SE 27-8-32w, was drilling ahead after making thorough tests of the Lansing at 4,283-97 ft.

The northeastern part of the state also had more tests under way than at any time since the Forest City basin play of more than a year ago, but so far none were getting important shows except in the McLouth gas area where a number of gas wells have been completed and one oil well was drilled some months ago.

Davidson Pool Gets North Extension

The Davidson pool of northern Barton County had an important northward extension last week in Harvey H. Blair 1 Foster, SE SE 33-15-12w, which started flowing from a break in the Lansing-Kansas City lime at 2,995-3,005 ft. and sprayed oil over the rig and equipment as a result of gas from another break at 2,940 ft.

The gas flow, found earlier, was estimated at from 4,000,000 cu. ft. to 5,000,000 cu. ft. The lime series was topped at 2,925 ft. and pipe was set at 2,928 ft. Operators were underreaming and preparing to complete the well.

Stafford County Test Shows for Pool Opener

Northern Stafford County apparently had a new pool last week 4 miles west of the town of Hudson. Stanolind Oil & Gas Co. 1 Ahnert, E½ NE SE 26-22-13w, had oil rising 700 ft. in the hole in 5 hours after the plug was drilled in the Arbuckle dolomite at 3,748-52 ft. The oil was 28 gravity. The new pay is 2½ miles due south of the Drach oil pool, the nearest production, which is also from the Arbuckle dolomite.

SUMMARY OF COMPLETIONS

Kansas

	No.	Bbl.	Footage
Oil wells: Fields	31	29,136	99,405
Dry holes: Fields	4	.....	14,111
Wildcats	4	.....	12,775
Total	39	.....	126,291

Nebraska

	No.	Bbl.	Footage
Dry holes: Wildcats	2	.....	2,951

WILDCAT COMPLETIONS

Helmerich & Payne 1 Loyd ..... E½ SE SE 6-4-17w. Dry, T.D. 3,830 ft., Arbuckle 3,681 ft., Phillips County.

Stanolind 1 Karber ..... N½ SW SE 5-16-1w Dry, T.D. 3,444 ft., Arbuckle 3,433-47 ft., P.B. 2,700 ft., no show, Saline County.

Hartman 1 Brothers ..... N½ NW NE 17-21-6w Dry, T.D. 3,540 ft., Mississippi lime 3,526 ft., Rice County.

Faulkner 1 Ward ..... E½ SE SW 21-21-13w Rig abandoned, Stafford County.

Marylyn Oil 1-A Freeman ..... SE SE SE 8-28-5e Dry, T.D. 1,861 ft., Lansing 1,740 ft., Butler County.

FIELD COMPLETIONS

Ainsworth, Barton County: Stanolind 4 Redetzke, W½ W½ SE 26-16-13w, 219 bbl., Arbuckle, T.D. 3,411 ft.

Bedford, Stafford County: Shell 1 Bedford, E½ SE NW 28-23-12w, 3,000 bbl., Arbuckle, T.D. 3,847 ft., acid.

Big Creek, Russell County: Lario 5 Waudby, NW SE 26-14-15w, 1,495 bbl., Gorham sand, T.D. 3,207 ft.

Schlemeyer 1 Billings, E½ NE SW 32-14-14w, 261 bbl., Kansas City lime, T.D. 3,051 ft., acid.

Palmer 1 Waudby, N½ NE NW 26-14-15w, 518 bbl., Gorham sand, T.D. 3,203 ft.

Lindas 3 Boxberger, W½ SE SW 24-14-15w, swabbed 48 bbl., Gorham sand, T.D. 3,207 ft.

East Big Creek, Russell County: Hayes & Cramm 2 Vonfeldt, E½ NW NW 6-15-14w, rig abandoned.

Campbell, Rice County: Lebsack 1 Sledd, NW SW NW 34-19-9w, 389 bbl., Arbuckle, T.D. 3,236 ft.

Chase, Rice County: Weaver 1 Robbins, S½ SW NE 19-19-9w, 103 bbl., Arbuckle, T.D. 3,284 ft.

Marland 1 Minta, E½ NE NW 30-19-9w, temporarily abandoned.

Donovan, Russell County: Wolf Creek 2 Donovan, N½ SW SE 10-15-15w, 625 bbl., Kansas City lime, T.D. 3,242 ft.

Emmeran, Ellis County: Bridgeport Machine 1 Witt, E½ NW NE 9-13-16w, dry, T.D. 3,636 ft.

Gorham, Russell County: Harry Gore 1 Schmitt, N½ S½ SW 15-14-15w, dry, T.D. 3,298 ft.

Gibson, Cowley County: Sinclair Prairie 1 Wilson, NE NE SW 29-34-3e, dry, T.D. 3,481 ft.

Greenvale, Russell County: Cities Service 2-B Major, E½ SE SE 5-15-12w, 716 bbl., Gorham sand, T.D. 3,220 ft.

Phil-Han 1 Soukup, NW SW 3-15-12w, 1,931 bbl., Kansas City lime, T.D. 3,035 ft., acid.

Hall-Gurney, Russell County: J. J. Hall 10-D Miller, NE SE NE 31-14-13w, 1,597 bbl., Kansas City lime, T.D. 2,868 ft., acid.

Skelly 2 Carter, N½ NE NW 33-14-13w, 60 bbl., Kansas City lime, T.D. 2,950 ft., acid.

Stanolind 7 Ben Rein, S½ SE NW 25-14-14w, 227 bbl., Kansas City lime, T.D. 3,000 ft., acid.

Krier, Barton County: Skelly 4-A Esfeld, W½ SW NE 30-16-11w, 269 bbl., Kansas City lime, T.D. 3,260 ft.

Laton, Rooks County: Krueger 4 Tatkenhorst, S½ SW SW 11-9-16w, swabbed 169 bbl., Kansas City lime, T.D. 3,224 ft.

Lost Springs, Marion County: Loriaux & Harrington 3 Novak, W½ SW 28-17-4e, 48 bbl., Mississippi chat, T.D. 2,409 ft.

Sunflower 2 Meyers, N½ SW NW 26-17-4w, 205 bbl., Mississippi chat, T.D. 2,408 ft.

Marshall, Ellis County: Amerada 1-A Hadley, W½ SW NW 32-11-17w, swab 75 bbl., Arbuckle, T.D. 3,615 ft.

Orth, Rice County: Bartlett 1 Boldt, S½ SW SE 22-18-10w, swabbed 47 bbl., Topeka, T.D. 2,813 ft.

Pawnee Rock, Pawnee County: Hall-Jordan 2-B Belt, N½ NE NW 13-20-11w, 3,000 bbl., Arbuckle, T.D. 3,802 ft.

Ray, Phillips County: Cities Service 1 Nichol, SW NW SW 33-5-20w, 2,593 bbl., Reagan, T.D. 3,601 ft., acid.

Roxbury, McPherson County: Stetbar 7 Union, NE SW 18-17-1w, 1,513 bbl., Mississippi chat, T.D. 2,679 ft.

Silica, Barton County: Connel 1 Burchart, SE SE SW 11-20-11w, dry, T.D. 3,336 ft.

Stoltenberg, Ellsworth County: Stanolind 1-B Schroeder, N½ NE NE 28-16-10w, 132 bbl., Arbuckle, T.D. 3,336 ft.

Straub, Barton County: Lauck & Moncrief 1 Dutton, N½ NW SW 36-18-11w, 123 bbl., Kansas City lime, T.D. 3,226 ft.

Trapp, Russell County: Leader 5 Hinterliter, SE SE NW 33-15-13w, 2,864 bbl., Arbuckle, T.D. 3,345 ft., acid.

Shell 4-C Bitter, SE SW 5-16-13w, 2,490 bbl., Arbuckle, T.D. 3,360 ft.

Wilkins, Ellsworth County: Cities Service 10-A Schroeder, S½ SE NW 29-17-9w, 2,177 bbl., Arbuckle, T.D. 3,236 ft.

Mudge 2 Schroeder, E½ NE 29-17-9w, 238 bbl., Arbuckle, T.D. 3,239 ft.

C. E. Ash 1-D Wilkins, NW NW 13-17-10w, swabbed 48 bbl., Arbuckle, T.D. 3,271 ft.

Zenith, Stafford County: Stanolind 9 Richardson, W½ SW NW 10-24-11w, 1,945 bbl., Viola, T.D. 3,820 ft., acid.

WILDCAT DRILLING REPORT

Western Kansas

Barber County: Pryor & Lockhart 1 Ishmael, S½ SE SW 35-34-11w, good stain 4,698-4,709 ft., base Mississippi 4,764-4,815 ft. T.D., 7-in. 4,612 ft., standard tools.

Barton County: Armer & Vernon 1 Redtzke, S½ SW NW 5-16-11w, 8-in. 2,220 ft., drilling 2,362 ft.

Olson Oil 1 Oltman, NE NE SW 15-17-13w, anhydrite 865 ft., drilling 1,040 ft.

Branine & Holl 1 Rexroot, E½ NE SE 22-17-13w, anhydrite 815 ft., 7-in. 2,470 ft., drilling 2,500 ft.

Shields 1-A Kimpler, W½ NW NE 31-18-11w, rigging up.

Helmerich & Payne 1 Roth, W½ NW SW 30-19-11w, Fort Riley, 1,650 ft., Topeka 2,720 ft., Lansing 3,093 ft., Sooy 3,351 ft., Arbuckle 3,377-85 ft., slight saturation and porous, running 5-in.

Butler County: Plymate 1 Falk, SW SW NE 14-29-3e, drilling 400 ft.

Adair & Morton 1 Piper, NE NW NE 36-29-4e, cellar.

Cowley County: Magnolia 1 Banta, S½ SE NE 26-30-5e, Lansing 3,529 ft., Mississippi lime 4,165 ft., drilling 4,445 ft.

Pryor & Lockhart 1 Bice, SE SE SE 24-30-5e, first report.

Steinbuchel 1 Peck, N½ NW SE 23-34-5e, drilling 450 ft.

Marylyn 1 Mosier, NW NW SW 21-34-7e, rigging up.

Dickinson County: Jones 1 Kuhn, E½ E½ SE 6-16-4e, drilling 2,000 ft.

Elk County: Allison 1 Porter, NW NE NW 25-28-8e, drilling 192 ft.

McPherson 1-A Batesman, SE SW NW 24-28-11e, at 495-97 ft. est. 1,000,000 cu. ft. gas, Kansas City 1,098 ft., show oil 1,106-11 ft., 5 bbl. water at 1,115 ft., show gas 1,142 ft., pay 1,201 ft.

Ellsworth County: Cities Service 2 Padlena, SE NW SE 26-14-10w, Lansing 2,760 ft., base Kansas City 3,068 ft., Sooy 3,134 ft., sandy conglomerate 3,201 ft., Arbuckle 3,229-36 ft., 4-in. 2,920 ft., shot 2,840-68 ft., 1½ bbl. water per hr.

Graham County: Cities Service 1 Gordon, SE NE NW 1-8-22w, 10-in. 320 ft.

Kearny County: Stanolind 1 Patterson, E½ SE SE 23-22-38w, anhydrite 2,127 ft., drilling 2,626 ft.

Marion County: Holl 1 Faulkerson, W½ NW NW 2-20-4e, Mississippi lime 2,260 ft., drilling 2,300 ft., with some show oil.

Basinger 1 Janseen, NE NE SE 9-21-3e, drilling 70 ft.

McPherson County: Westgate-Greenland 1 Rosander, E½ SW SW 33-17-2w, drilling 1,206 ft.

Norton County: Helmerich & Payne 1 Hewitt, S½ SE NE 11-4-21w, anhydrite 1,810 ft., drilling 2,310 ft.

Shaffer 1 Vanmayrhauser, N½ NW NE 26-5-22w, anhydrite 1,800 ft., drilling 2,850 ft.

Phillips County: Wirick 1 Friebus, W½ SW NW 36-2-19w, Arbuckle 3,535-39 ft. with no show, cored dense dolomite and shale 3,539-56 ft., cored broken limestone 3,556-73 ft., granite wash 3,815 ft., granite 3,861 ft. T.D., set 5½-in. 3,445 ft.

Lario 1 Lynch, S½ SE SW 24-4-20w, Fort Riley 2,145 ft., base Americus 2,615 ft., Topeka 2,935 ft., Lansing 3,168 ft., some show oil 3,175-80 ft., gas, show oil 3,250 ft.

Aladdin 1 Wiltrout, S½ SE NE 18-5-20w, first report.

Reno County: Simpson 1 Snowbarger, SW SE NE 21-23-10w, surface hole.

Central 1 Dyck, W½ NW SW 4-22-4w, first report.

Rice County: Bronson 1 Brown, W½ NW SW 2-19-9w, drilling 1,345 ft.

Anderson-Prichard 1 Yeo, S½ SW NW 29-20-10w, Lansing 2,998 ft., some show oil 3,032-35 ft., show oil 3,078-80 ft., cored spotted saturation 3,080-90 ft., Sooy 3,256 ft., Simpson dolomite 3,280 ft., Simpson shale 3,284 ft., Arbuckle 3,299-3,302 ft. with show oil, 5-in. 3,300 ft.

Rooks County: Clay 1 Anderson, W½ SW SW 28-9-16w, Arbuckle 3,569 ft., T.D. 3,590 ft., P.B. 3,330 ft., acidized at 3,412 ft., some show oil, more acid, no help.

Russell County: Derby 1 Gernon, W½ SW NE 20-13-15w, Fort Riley 1,825 ft., Topeka 2,765 ft., show oil 2,945-59 f., Lansing 3,030 ft., some show oil 3,084-89 ft., Arbuckle 3,289 ft., cored 3,290-92 ft., recovered 2 ft. with small spots oil, cored good porosity 3,296-3,300 ft., T.D. 3,308 ft.

Central 1 Stevens, E½ SW SW 3-13-14w, first report.

Cities Service 1 Stoppel, NW NE SW 17-14-11w. drilling 2,705 ft.

Cities Service 1 Beisel, NE NE NW 15-14-12w, Arbuckle 3,315-40 ft., 4½-in. 3,301 ft., shot 3,050-64½ ft., 2,940-51 ft., and 3,013-27 ft., water 3,013-24 ft., bailed 2 bbl. water an hr. and some show oil.

Central 1 Steinlie, N½ NW NE 29-15-12w, building rig.

Central 1 Harbaugh, NW NW NW 21-14-12w, rig.

Stafford County: Stanolind 1 Ahnert, E½ NE SE 26-22-13w, Viola 3,655 ft., Simpson 3,689 ft., Arbuckle 3,745-48 ft., gas and show oil, cored dolomite with fair saturation 3,748-52 ft., 5-in. 3,746 ft., T.D. 3,752 ft., 700 ft. oil in hole in 5 hr., gravity 28.

W. W. Drilling 1-A Wilson, N½ NW NW 5-25-14w, drilling 3,200 ft.

Thomas County: Alva Billings 1 Ryan, E½ NE SE 27-8-32w, Lansing 4,283-97 ft., gas show oil, H.F.W. 4,373 ft., acid at 4,283-95 ft., more acid, no help, drilling ahead.

AVERAGE DAILY PRODUCTION

LEADING KANSAS FIELDS

	June 21	June 14
Augusta	1,300	1,200
Bemis-Shutts	9,550	9,500
Bloomer	6,050	6,050
Burnett	9,400	4,850
Burrton	7,050	8,400
Chase	6,200	5,450
Elbing	1,050	1,100
El Dorado-Towanda	7,300	7,200
Geneseo	6,650	6,950
Graber	2,700	2,600
Greenwood County	9,350	9,300
Hollow-Nikkel	1,450	1,450
Keesling	1,350	1,050
Lerado	600	800
Lorraine	1,100	750
Oxford	550	600
Rainbow Bend	900	750
Raymond	1,400	1,250
Ritz-Canton	3,900	4,100
Trapp	20,900	20,150
Balance Russell County	23,100	23,800
Sedgwick County	3,050	3,050
Voshell	1,650	1,850
Silica	20,750	17,750
Wellington	1,000	1,250
Wherry	2,250	2,450
Zenith	8,550	8,600
Others	72,350	66,050
Total Kansas	231,450	218,550

Northeastern Kansas

Brown County: McAlpine 1 Tyler, NE SW SW 4-3-15e, show oil 1,350 ft.

Doniphan County: Plymate & Bornholdt 1 Elliott, E½ SE SW 31-3-20e, Kansas City 720 ft., Mississippi lime 1,679 ft., Misener 2,175 ft., Hunton 2,195 ft., drilling 2,510 ft.

(Continued on Page 117)

Deep Strike at El Dorado Marks Field's Twentieth Year

By GEORGE WEBER

SHREVEPORT, La., June 23.—As Arkansas celebrated the twentieth anniversary of the El Dorado field where oil was first discovered in the state, the same area yielded its first deep production last week. C. H. Murphy brought in 1-C Cates, 33-18-15, making 144 bbl. of oil and 96 bbl. of salt water from a Cotton Valley sand perforated at 6,023-27 ft. The test was carried to the Smackover lime but failed to find production at that level. Several weeks of perforating and testing various horizons resulted in the final completion of the well last week.

SUMMARY OF COMPLETIONS

North Louisiana

	No.	Bbl.	Footage
Oil wells: Caddo	2	170	3,272
Olla	1	98	2,435
Sugar Creek	1	190	6,431
Wildcats	1	107	5,018
Gas wells: Monroe	3	*1.8	6,554
Sligo	1	*62.5	5,334
Dry holes: Bethany	1	.....	95
De Soto-Red River	1	.....	3,140
Olla	2	.....	6,302
Wildcats	1	.....	224
Total	14	.....	38,605

Arkansas

	No.	Bbl.	Footage
Oil wells: El Dorado	2	204	10,079
Gas wells: Dorcheat	1	†240	9,017
Dry holes: Mount Holly	1	.....	1,650
Nick Springs	1	.....	3,363
Wildcats	2	.....	4,984
Total	7	.....	29,093

*Million cu. ft.
†Includes 2,160,000 cu. ft. gas.

New Field East of Schuler Attracts Interest

The Crescent Drilling Co. 1 Burns, new pool discovery east of the Schuler field in Union County, is the subject of much interest. The wildcat was recently completed as a high gas-oil-ratio well in one of the Morgan sands of the Cotton Valley formation. It produces 43-gravity oil and gas at a ratio of about 15,800 cu. ft. per barrel. The Jones sand was encountered in the test higher than the highest well in the Schuler field, and the upper 3 ft. showed good oil saturation. The sand was mostly water sand, however, and the deeper Smackover lime also showed salt water. The new pool lies on another uplift located generally southeast of the main Schuler field. The producing sand is 14 ft. thick and shows a porosity of 25 per cent.

ARKANSAS COMPLETIONS

Wildcats

Union County: C. H. Murphy 1-C Cates, NW SW 33-18-15, 144 bbl. oil, 96 bbl. salt water, flow valves, 450 lb. input C.P., T.D. 7,820 ft., perf. 6,023-27 ft., *new deep discovery.*
Arkansas County: C. W. Robinson 1 E. P. Fox, SE 23-5s-3w, dry, 4,372 ft.
Clark County: Coker Oil Corp. 1 Guess, SE NE 2-11s-20w, dry 612 ft.

Fields

Dorcheat, Columbia County: C. H. Murphy 1 B. G. Barton, SW NW 14-18-22, 2,160,000 cu. ft. gas, 240 bbl. condensate, 13/64-in. choke, T.P. 2,750 lb., C.P. 2,850 lb., T.D. 9,017 ft., 6-in. casing 9,000 ft.
El Dorado, Union County: Consolidated 1 Summers, NW NE SW 13-18-14, pumped 60 bbl., T.D. 2,259 ft., 5½-in. casing 2,244 ft.
Mount Holly, Ouachita County: Lee Bergman 1 Cook, NW SW SW 27-15-18, T.D. 1,650 ft., salt water.
Nick Springs, Union County: T.D. 3,363 ft., junked.

WILDCAT DRILLING REPORT

Columbia County: McAlester Fuel Co. 1 Franks, SE SE 16-18-21, stuck drill stem 2,590 ft., T.D. 8,781 ft.
Howard County: Miller & Fletcher 1 Dierks Lumber Co., SW SW 7-8s-28w, S.D. 500 ft.
Jefferson County: Patterson & Stratton 1 F. and D. Stratton, SE NW NE 35-6s-9w, T.D. 1,693 ft., S.D.
Ouachita County: Arkansas Fuel Oil Co. 1 McGaughey, NW NW 6-15-18, T.D. 3,320 ft., arranging to deepen.
Prairie County: Alvin E. Stark 1 Fidelity Mutual, NE NE SW 16-2n-6w, drilling 1,267 ft.
Saline County: A. W. Given 1 Williams, NE NE 18-3s-15w, T.D. 1,090 ft., reaming to bottom.
Union County: Consolidated Pet. Co. 1 Union Sawmill Co., SE NE NE 15-18-14, waiting on standard rig, T.D. 2,250 ft.

New Wilcox Sand Pool Found In La Salle Parish

H. R. Scivally of Shreveport has discovered another Wilcox oil field in southern La Salle Parish. The 1 Tensas Delta, located SW NE 12-6n-4e, tested 15 bbl. per hour of 43.7-gravity oil through a 16/64-in. choke with tubing pressure of 425 lb., and casing pressure of 625 lb. The well tested no salt water.

Bottomed at 5,510 ft., the hole was cased with 4,826 ft. of 7-in. casing. First perforations at 4,757-62 ft. showed salt water, and the same horizon after squeezing and reperforation showed salt water and a show of oil. The operator then squeezed and reperforated at 4,755-60 ft. with 30 shots and brought in the well without salt-water flow. An official gage has not been made, but it is expected to exceed the 15-bbl.-per-hour mark. The new field will probably be called the Walters field.

The Wilcox trend production in Louisiana now extends along a north-south direction for a distance of about 80 miles. This is across the main trend of the formation which swings to the southwest around the Sabine uplift and into the Coastal district of Texas. Its possible eastward trend is not yet determined, but it may be expected eventually to swing northeastward in the Mississippi embayment and tie into the Tinsley area.

Wilcox Field Extension Or Field Opener Gaged

The H. L. Hunt 1-C Goodpine, SW NW 33-8n-3e, about 2 miles north of the Nebo field, La Salle Parish, was officially gaged last week at 107 bbl. of oil and 276 bbl. of salt water on gas lift. The test topped the Wilcox at 2,490 ft., and perforated for production at 3,510-14 ft. It is not yet known whether it extends production in the Nebo field, or represents a separate field discovery.

Ajax Extension Makes Gas After Showing Some Oil

W. Paul Edman et al 1 Tanner estate has been shut in for orders, after testing an estimated 10,000,000 cu. ft. of gas through perforations at 3,172-78 ft. The well previously showed some oil. It is located in a west offset position to the J. E. Watts 1 Tanner, Ajax field discovery well which made 5 bbl. of oil and 25 bbl. of salt water on a pump. The Edman well is located in 13-10-11, De Soto Parish, and the discovery well in 18-10-10, Natchitoches Parish. A new location has been staked by G. H. Neighbors, ⅛ mile north.

New Wildcats Staked at Lisbon and Urania

Two new wildcats of particular interest were staked last week. Northeast of the Pettit production on the Lisbon structure, Claiborne Parish, Big West Drilling Co. staked 1 Alford. The deep test is north of the company's deep failure of a few weeks ago, and is higher on the major Lisbon structure. The former test, 1 Patton estate, Lincoln Parish, encountered sand bodies in the Cotton Valley formation, but showed salt water in them. Corresponding sands to the west and northwest are producing gas and condensate in two deep wells at Lisbon.

The second interesting test is Arkansas Fuel Oil Co. 13-A Tremont, in the Urania field, more than 3 miles west of Olla. The test had an odor of oil at 1,572-82 ft., in the top of the Wilcox and will explore the deeper possibilities of the formation. The Olla group of sands producing at Olla and other new Wilcox fields in the parish is located several hundred feet below the top of the Wilcox.

NORTH LOUISIANA COMPLETIONS

Wildcats

La Salle Parish: H. L. Hunt 1-C Goodpine, SW NW 33-8n-3e, 107 bbl. oil, 276 bbl. salt water, gas lift, T.D. 5,018 ft., 7-in. casing 3,505 ft.
Harry Shulman et al 1 V. B. Whidden, SW NE 9-9n-3e, dry, T.D. 224 ft.

Fields

Bethany, Caddo Parish: L. M. Calhoun, trustee, 1 Scott, NW 8-16-16, T.D. 95 ft., abandoned, will not drill.
Caddo, Caddo Parish: M. H. Marshall 1 Goodwin, NW SW NW 33-21-15, pumped 20 bbl., T.D. 1,587 ft., 6⅝-in. casing 1,398 ft.
Stanolind Oil & Gas Co. 135 Dillon, SW SW SW 12-21-15, 150 bbl. oil, 15 bbl. salt water, ¼-in. choke, C.P. 425 lb., T.D. 1,685 ft., 5½-in. casing 1,553 ft.
De Soto-Red River. De Soto Parish: G. H. Neighbors 3 Ramsey, SE NE NW 36-11-11, old well drilling deeper, old T.D. 2,942 ft., dry, 3,140 ft.
Monroe, Union Parish: Inabinette & Pipes 1 Edwards, SW NW 11-21-3e, 554,000 cu. ft. gas, R.P. 855 lb., 6-in. casing 2,107 ft., T.D. 2,162 ft.
Inabinette & Pipes 2 Jordan, W½ NE SE 10-21-3e, 1,104,000 cu. ft. gas, R.P. 850 lb., 6-in. casing 2,118 ft., T.D. 2,180 ft.
Monroe, Ouachita Parish: Southern Carbon Co. 9 Richland, C E½ 26-19-4e, 184,000 cu. ft. gas, R.P. 296 lb., 6-in. casing 2,162 ft., T.D. 2,212 ft.
Olla, La Salle Parish: Ark. Fuel Oil Co. 14-C Tremont, NE SE 3-9n-2e, pumped 98 bbl. oil, 2 bbl. salt water, T.D. 2,435 ft., 7-in. casing 2,429 ft., perf. 2,065-75 ft.
Placid Oil Co. 97 La. Central, NE NW 31-10-3e, T.D. 2,429 ft., dry.
Placid Oil Co. 5-A Tremont, SE NW 8-9-2, T.D. 3,873 ft., dry.
Sligo, Bossier Parish: Union Prod. Co. 2-A S. L. Herold, C NW 29-17-11, 62,500,000 cu. ft. gas, R.P. 1,895 lb., T.D. 5,335 ft., 7-in. casing 5,334 ft., perf. 5,040-90 ft., 5,000 gal. acid.
Sugar Creek, Claiborne Parish: Hassie Hunt 1 Deas, SE SE 12-19-6, 190 bbl., 28/64-in. choke, T.D. 350 lb., C.P. 800 lb., T.D. 6,431 ft., 7-in. casing 6,208 ft., perf. 5,746-64 ft.

WILDCAT DRILLING REPORT

Bienville Parish: R. E. Collins et al 1 Madden heirs, SW SW SE 3-16-8w, setting casing 43 ft.
Caldwell Parish: Big West Drlg. Co. 1 A. Lowe, SE SE 36-12-3e, coring 2,575 ft.
Southern Carbon Co. 1 Howard, SW SE 13-14n-4e, rigging up.
De Soto Parish: J. E. Stack et al 1 Cook, NW NE 32-13-14, drilling plug 2,890 ft.
La Salle Parish: Little River Oil Co. 1 Whatley, NE NE 18-7n-2e, S.D. 2,701 ft.
H. R. Scivally, trustee, 1 Tensas Delta, SW NE 12-6n-4e, flowing 15 bbl. 43-gravity oil hourly, 16/64-in. choke, T.D. 425 lb., C.P. 625 lb.
Morehouse Parish: Union Prod. Co. 1 Henkle, C SW 3-21n-7e, drilling 2,315 ft.
Natchitoches Parish: Rhodes & O'Mara 1 Prudential Life, NE SE 36-11-10, drilling 3,761 ft.
West Carroll Parish: R. H. Crowe, trustee 1 Bruce Lumber Co., SE 16-21-9e, moving in material.
Claiborne Parish: Big West Drlg. Co. 1 Alford, C W½ 11-21-4w, first report.
Franklin Parish: S. J. Reynolds 1 Womble, NW NW NW 11-12n-8e, first report.

EAST TEXAS BORDER DRILLING REPORT

Sabine County: Paul Pewitt 1 Mrs. H. E. Barton, John S. Lacy Sur., drilling 3,016 ft.
Sturm & Womack 1-A Keith, L. Grace Sur., T.D. 6,925 ft., running casing 6,725 ft., reported show oil 6,642 ft.
San Augustine County: Roper & Todd 1 Long Bell, N. Hyden Sur., drilling 3,660 ft.

AVERAGE DAILY PRODUCTION

NORTH LOUISIANA

	June 21
Caddo, light	6,110
Caddo, heavy	2,230
Cotton Valley	18,390
Cross Lake	2,685
De Soto and Red River	1,025
Haynesville	2,650
Homer	2,875
Lisbon	2,785
Nebo	2,105
Olla	12,135
Rodessa	14,925
Sligo	2,000
Sugar Creek	1,655
Urania	2,290
Zwolle	1,150
Total North Arkansas	77,660

SOUTH ARKANSAS

Atlanta	2,825
Buckner	2,535
Champagnolle	875
Dorcheat	1,800
El Dorado	1,420
Magnolia	20,150
Nick Springs	965
McKamie	2,810
Rodessa	1,490
Schuler	16,750
Smackover, light	1,850
Smackover, heavy	12,950
Troy	1,020
Urbana	2,000
Village	1,010
Total South Arkansas	72,860

MISSISSIPPI

Tinsley	27,455
Pickens	560
Total Mississippi	28,015

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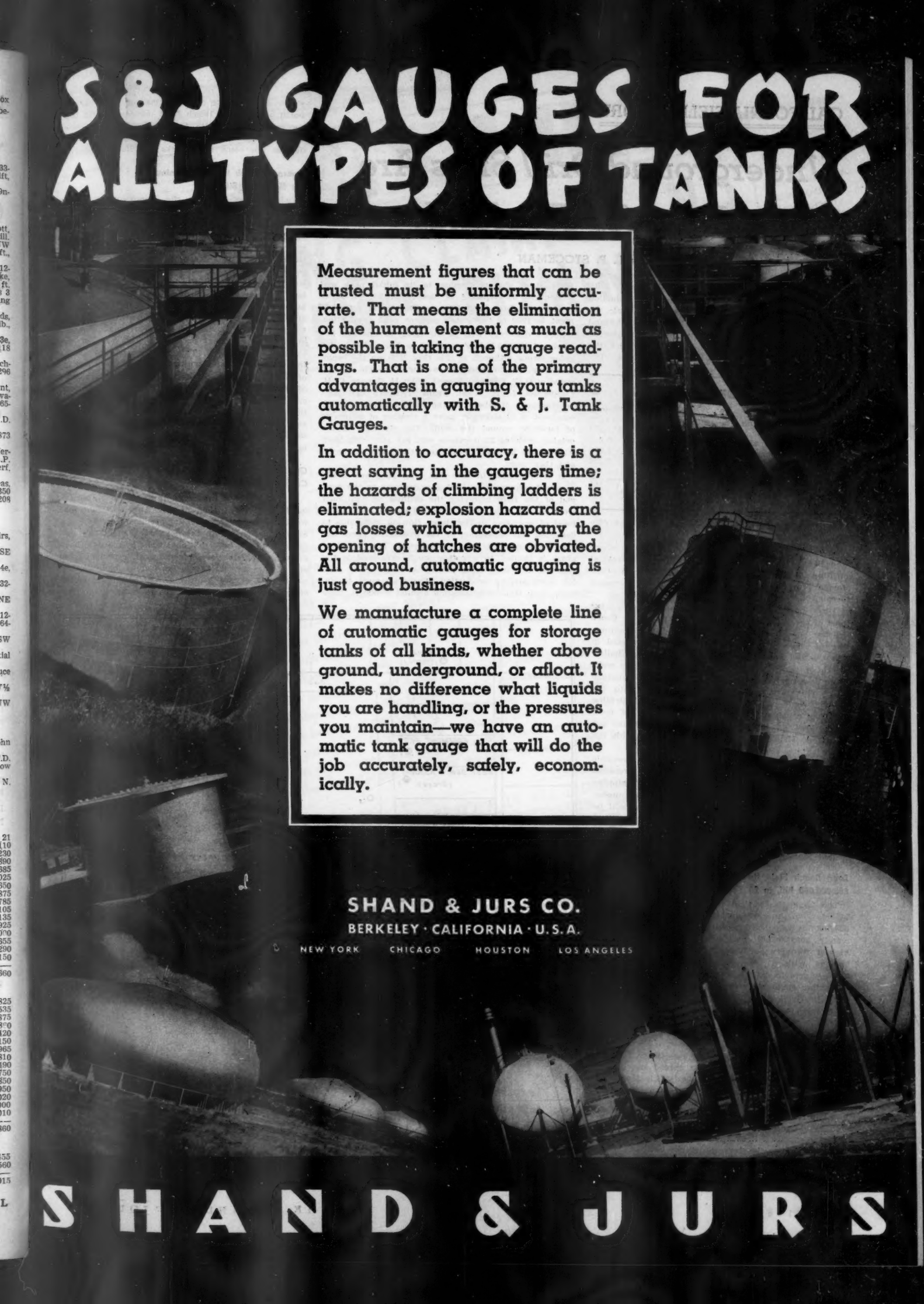

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Underground Drill Sites Are Considered for Tidelands

By L. P. STOCKMAN

LOS ANGELES, Calif., June 23.—California, with a long string of "firsts" in drilling and production technique, is planning another, almost fantastic, innovation. It would be the development of tideland deposits in the Long Beach section of the Wilmington field through underground tunnels out beyond the tide line. Last week the proposal, submitted by Dynamic Industries Co., was before the Long Beach City Council for approval.

Observers pointed out that it was in California where the first production of oil and gas from directional drilling into tideland reserves was obtained. California also had the first wells drilled in the open ocean.

Directional drilling has already proved that a large part of the Wilmington field extends into Long Beach Harbor beneath the Pacific Ocean and, while a number of large flowing wells have been completed in the tideland accumulation, the comparatively shallow depth at which production is found precludes wells from reaching far out into the center of the accumulation. This proposal to dig a tunnel out into the harbor would call for the construction of a drilling chamber capable of permitting the drilling of from 10 to 20 wells. Engineers say the plan, worked out by H. A. Hansen, civil engineer formerly with the United States Geodetic Survey, is feasible.

Three productive zones are believed to be accessible over at least 1,000 acres by the tunneling proposal. Surface development is impossible because of shipping and United States fleet requirements. Actual undertaking of the underground drilling, however, will be held up pending the straightening out of a number of difficulties including satisfactory safety arrangements and a clearing up of mineral rights in which the United States Government is interested.

SUMMARY OF COMPLETIONS

	No.	Bbl.	Footage
Oil wells: San Joaquin Valley	9	10,306	53,896
Coastal district	3	670	17,287
Los Angeles Basin	11	6,515	50,410
Dry holes: San Joaquin Valley	2	.....	1,900
Coastal area	1	.....	7,134
Total	26	.....	130,627
Recomp.: Los Angeles Basin	4	385	.....

Long Beach Field Has Produced 658,000,000 Bbl. in 20 Years

The Long Beach field will celebrate its twentieth birthday on June 25 during which it has produced 658,563,779 bbl. of crude oil or an average of approximately 506,000 bbl. per acre. This is by far the highest recovery per acre in California as Santa Fe Springs, with a recovery of approximately 375,000 bbl. per acre to date, is its closest competitor from a production standpoint. Present proved acreage of the Long Beach field is 1,300 acres and at last reports 1,230 wells were producing. Since discovery by Shell Oil Co., Inc., back on June 25, 1921, a total of about 1,500 wells have been drilled. Shell's discovery well is located on the southeast slope of Signal Hill and for several months the field was known as the Signal Hill field. Soon, however, production spread out in all directions and in accordance with established practice of naming a field for the nearest city or town for identification purposes the Signal Hill field became the Long Beach field. Signal Hill is the highest feature of the field and its name has come down from a period when Indians used it as a signal point. Discovery of this field started the largest drilling boom in California and Long Beach, Santa Fe Springs and Huntington Beach resulted in the first attempt to secure curtailment as simultaneous development of these three fields shot production to its initial peak and subsequent development of deeper productive zones in the same three fields later resulted in the establishment in 1929 of the state's present peak production.

Shell's discovery well in the Long Beach field has produced 670,000 bbl. of crude oil to date and it is still going strong although at this time it is on the beam. The crew on tour when the well was brought in consisted of O. P. (Happy) Yowell, John H. George, C. H. Cuppernell, L. R. Wahl, Frank Truelove and Matt Schumacher. Members of the original group which consisted of 23 members carry a number of memories of incidents around the well. The six men of the original crew of 23 members who are still with Shell will always believe, "those were the good old days" and they were.

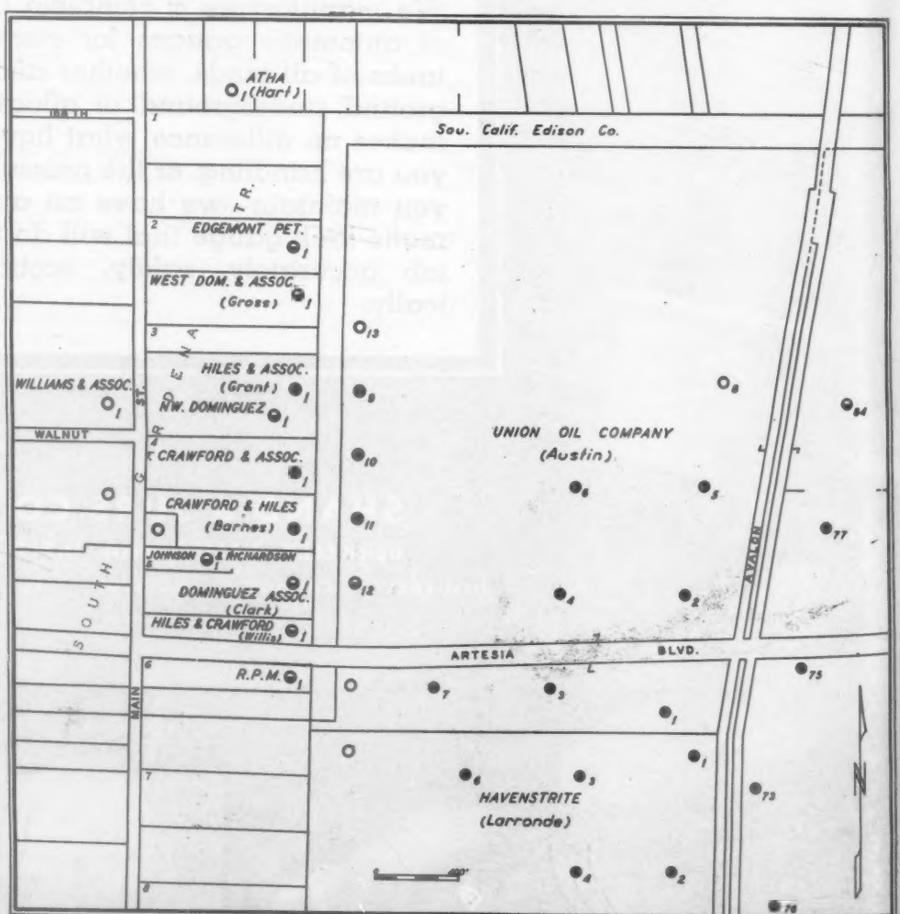
It is interesting to note that after 20 years of life a new development is getting under way in the west end of the field involving the drilling of additional wells to the lower Brown zone. There is little likelihood of operators getting large flowing wells due to depletion and exhaustion of the productive zones but good pumping wells may be expected. This new program is limited to a rather small area and is the result of this zone being passed up in the early rush for more prolific production. Early attempts to develop deep Miocene production around 10,000 ft. have so far proved quite disappointing but other attempts north of the Long Beach fault may meet with better success in which event this field may again become active. To date all but a very small part of the production has come from rocks of Pliocene age.

Operators Look to West Dominguez For New Drill Sites

Drilling operations in the Dominguez field have reached the point where it will mean that operators must extend the limits of production to the west in order to get many more drilling locations as there is a string of drilling and completed wells for practically the entire length between the northern and probable southern limits of production. Preparations are under way to drill west of Main Street which has heretofore been considered the probable outer limits of production but which at present does not appear so far out. It appears almost certain at this time that production will be developed west of Main Street and the only questionable thing at present is just how far west the limits will extend. This is emphasized by the fact that one of the most westerly wells in the west end of the Dominguez field has cored a greater thickness of oil sand than any other well in the area. The northern limits of production were definitely established this week by 1 Gross of West Dominguez Associates and Edgemont 1 Dominguez both of which found the seventh Callender zone wet or gray. The latter well has also found the eighth Callender zone wet.

Good Flowing Well Is Completed at Inglewood

Jefferson Oil Co. completed an excellent flowing well in the Inglewood field of Los Angeles County this week and two more potential producers are scheduled for completion within the next week. This new completion and the two additional wells in the pay should greatly stimulate development work especially since one of the new wells scheduled for completion next week is 7 I. H. Smith of Texas Co. which will require at least one offset. This tends to indicate the prob-



Union Oil Co. is offsetting well for well in the west end of the Dominguez field of Los Angeles Basin where a townlot-drilling campaign is under way. Western limits of production remain undetermined and preparations are under way to extend drilling operations west of Main Street

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New Eastman Full-Gauge Self-Orienting Hole Straightening and Deflecting Tool Greatly Reduces Drilling Time

Sought for years by drilling department personnel, oil field service companies, and hordes of inventors alike, a self-orienting deflecting tool is available at all of the service branches of the Eastman Oil Well Survey Companies for use in hole straightening operations, controlled directional drilling, and side-tracking. Proved practical in field operations in widely scattered areas where nearly all types of formations are encountered, the Eastman DRIFTMASTER, a Full-Gauge Self-Orienting Deflecting Tool effects amazing reductions in time and cost to the operator over present methods which involve orienting clamps for determining the direction of deflecting tools at the bottom of the well.

In addition to the well-known and accepted knuckle joint principle, the DRIFTMASTER embodies automatic features which enables it to orient itself upon reaching the bottom of the hole. In straightening a well, a record of inclination only is sufficient. In deflecting work, the only preliminary required in the nature of a survey is a single shot instrument reading of inclination and direction taken at the bottom of the well before the DRIFTMASTER is run.

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Made up on the drill pipe, the DRIFTMASTER is run to bottom in the same manner as an ordinary drilling bit. When bottom is reached the automatic features become operative with the application of weight, and the DRIFTMASTER *orients itself to the low side of the hole.* Drilling may be begun almost immediately without first running a check survey or orienting the pipe.

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The new DRIFTMASTER Full-Gauge Self-Orienting Deflecting Tool is available for use in all foreign and domestic fields. In the United States, the work is performed by experienced Eastman operators, fully trained in the application of the DRIFTMASTER to problems involving deflecting, sidetracking and hole straightening techniques.

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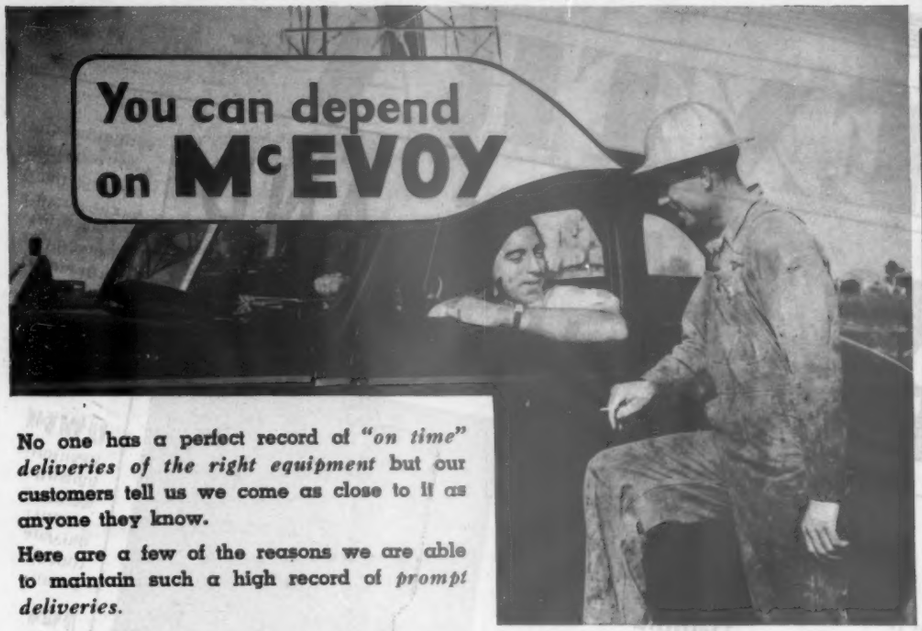

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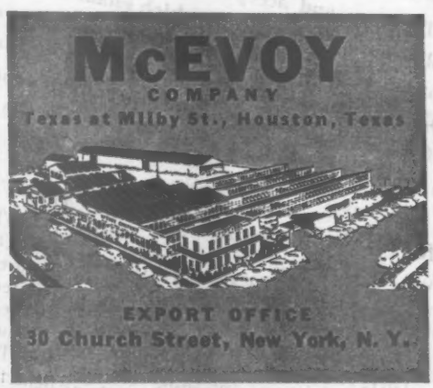

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ability that major companies will soon find it necessary to undertake offset drilling to protect their respective leases from drainage.

This deep drilling program in the Inglewood field has the Miocene as the objective and this horizon has yielded relatively large flowing wells in the northwest end of the field where present work is centered. No attempt is being made to conform with curtailment and this may force Texas and others to do likewise. All completions to date have been in what is believed to be the Sentous zone originally found in 1 Sentous of

SUMMARY OF PRODUCTION

	June 21	June 14
Wilmington	83,535	84,525
Long Beach	41,695	41,950
Midway-Sunset	41,550	54,125
Coalinga	38,275	35,650
Kettleman North Dome	38,125	38,250
Ventura Avenue	35,425	32,750
Huntington Beach	28,950	30,150
Dominguez	26,725	26,350
Santa Fe Springs	23,425	23,325
Santa Maria Valley	19,375	18,625

R. R. Bush Oil Co. in the extreme southern end of the Inglewood structure. It is upper Miocene in age and is found about 2,000 ft. below the Rindge zone. To date none of the operators holding leases in the older section of the field have started deep drilling but should start soon.

LOS ANGELES BASIN COMPLETIONS

Dominguez, Los Angeles County: Shell 116 Reyes, flowed gas lift 363 bbl., 30.6-gravity, 3.4 per cent cut, 330,000 cu. ft. net formation gas, T.D. 4,225 ft., perf. 3,848-3,982 ft., 3,992-4,037 ft., 4,047-4,123 ft., 4,137-74 ft., 4,184-4,218 ft., completed in first Callender zone of Pliocene age.

Union 10 Austin, 29-3s-13w, flowed 1,425 bbl., 31.4-gravity, 1.4 per cent cut, 900,000 cu. ft. gas, 70/64-in. bean, pressures 750/1,000 lb., T.D. 7,213 ft., perf. 7,173-7,213 ft., completed in seventh Callender zone of Miocene age.

Huntington Beach, Orange County: J. E. F. Oil Co. 2 Schaaf, 36-5s-11w, pumped 95 bbl., 17.5-gravity, 1.2 per cent cut, T.D. 4,287 ft., perf. 4,227-87 ft., completed in Ashton zone of Miocene age.

H. C. Morton 1 Beare, 34-5s-11w, pumped 45 bbl., 22.5-gravity, 5 per cent cut, T.D. 5,343 ft., P.B. 4,700 ft., perf. 4,380-4,590 ft., 4,957-83 ft., 5,055-75 ft., completed in lower Ashton zone of Miocene age.

Inglewood, Los Angeles County: Jefferson Oil Co. 1 R. C. Smith, 7-2s-14w, flowed 2,250 bbl., 33.1-gravity, 0.2 per cent cut, 1,300,000 cu. ft. gas, 32/64-in. bean, pressures 1,000/1,500 lb., T.D. 8,089 ft., perf. 7,379-8,089 ft., completed in Sentous zone of Miocene age.

Long Beach, Los Angeles County: Axis Pet. Co. 2 Woods, 29-4s-12w, pumped 120 bbl., 19.2-gravity, 15 per cent cut, T.D. 3,680 ft., perf. 3,050-3,440 ft., 3,465-3,580 ft., recompleted in upper Brown zone of Pliocene age.

Montebello, Los Angeles County: York Oil Co. 1 Lehman, 11-2s-12w, pumped 16 bbl., 34.1-gravity, 6 per cent cut, T.D. 7,660 ft., perf. 7,561-7,660 ft., recompleted in seventh zone of Miocene age.

Torrance, Los Angeles County: Wood-Callahan 1 Dominguez estates, 5-4s-14w, pumped 80 bbl., 17.1-gravity, 3.1 per cent cut, T.D. 3,730 ft., perf. 3,318-3,729 ft., completed in equivalent of Ranger zone.

Wilmington, Los Angeles County: L. B. Oil Dev. Co. 25-W Harbor, 10-5s-13w, flowed 198 bbl. 23.2-gravity from upper Terminal zone, flowed 120 bbl. 25.9-gravity from lower Terminal zone, 18/64-in. and 15/64-in. beans, T.D. 4,097 ft., perf. 3,051-3,532 ft., 3,640-4,080 ft., completed in tideland area by directional drilling.

L. B. Oil Dev. Co. 27-W Harbor, 3-5s-13w, flowed 648 bbl. 22.6-gravity clean oil through 48/64-in. bean from Ranger zone and 668 bbl. 25.3-gravity clean oil through 32/64-in. bean from upper Terminal zone, 88,000 cu. ft. gas, T.D. 3,988 ft., perf. 2,755-3,039 ft., 3,450-3,707 ft., 3,902-82 ft., completed in tideland area by directional drilling.

Mitchell & Son 1 Newman, 29-4s-13w, pumped 196 bbl., 17.3-gravity, 10 per cent cut, T.D. 3,723 ft., perf. 3,038-3,149 ft., 3,212-3,310 ft., 3,471-3,602 ft., 3,648-3,715 ft., completed in Ranger zone.

Richfield 1 Victory, 35-4s-13w, pumped 94 bbl., 17.2-gravity, 15 per cent cut, T.D. 3,456 ft., P.B. 3,443 ft., gravel-packed perf. 2,974-3,018 ft., 3,151-3,455 ft., recompleted in Ranger zone after hole cleaned out to 3,455 ft., plugged back to 3,443 ft. and gravel packed.

Union Pacific R. R. 38 fee, 33-4s-13w, pumped 155 bbl., 19.4-gravity, 2.6 per cent cut, T.D. 3,375 ft., redrilled to 3,260 ft., gravel-packed perf. 2,968-3,041 ft., 3,059-3,108 ft., 3,149-3,251 ft., recompleted in Ranger zone.

Union Pacific R. R. 185 fee, 9-5s-13w, flowed 227 bbl., 18.1-gravity, 1.4 per cent cut, 58/64-in. bean, pressures 700/150 lb., T.D. 3,596 ft., perf. 2,751-2,825 ft., 2,839-78 ft., 2,918-97 ft., 3,272-3,363 ft., 3,404-3,523 ft., 3,547-87 ft., completed in Ranger zone.

Union Pacific R. R. 187 fee, 3-5s-13w, flowed 548 bbl., 23.7-gravity, 0.3 per cent cut, 48/64-in. bean, pressures 450/620 lb., T.D. 2,770 ft., gravel-packed perf. 2,526-90 ft., 2,615-35 ft., 2,664-2,761 ft., completed in Ranger zone.

LOS ANGELES BASIN OUTPOSTS

Dominguez, Los Angeles County: Atha and Associates 1 Dominguez, 29-3s-13w, rig erected, elev. 35 ft.

Dominguez Associates 1 Clark, 29-3s-13w, drilling 598 ft. in sand, elev. 35 ft.

Edgemont Pet. Co. 1 Dominguez, 29-3s-13w, drilling and coring 7,565 ft. in sand and shale, elev. 35 ft.

Hiles-Crawford and Associates 1 Willis, 29-3s-13w, drilling in sand and shale 6,297 ft., elev. 35 ft.

R. E. Havenstrite 1 Larronde, 29-3s-13w, derrick erected.

Johnson & Richardson 1 Clemar, 29-3s-13w, drilling 7,190 ft. in sand and shale.

N. W. Dominguez Oil Co. 1 Grant, 29-3s-13w, drilling 5,884 ft. in sand, elev. 35 ft.

M. P. R. Oil Co. 1 Barnett, 29-3s-13w, drilling 5,191 ft. in sand, elev. 32 ft.
West Dominguez Associates 1 Gross, 29-3s-13w, T.D. 7,302 ft. in gray sand, P.B. 6,026 ft. to whipstock to south, had only 9 ft. oil sand.
Inglewood, Los Angeles County: R. R. Bush Oil Co. 1 Merchants, 7-2s-14w, drilling in sandy shale 7,550 ft., elev. 190 ft.
R. R. Bush Oil Co. 1 Smith, 7-2s-14w, drilling 8,140 ft. in sand and shale, elev. 185 ft.
Federal Oil Co. 2 Smith, 7-2s-14w, drilling 7,998 ft. in sandy shale, elev. 215 ft.
Hogan Pet. Co. 1-A Machado, 7-2s-14w, drilling oil sand and shale 7,224 ft., top Miocene 5,490 ft., elev. 106 ft.
Oscar Howard 1 Valenzuela, 7-2s-14w, drilling 7,209 ft. in sand, elev. 135 ft.
Jergins Oil Co. 2 Howard, 7-2s-14w, location graded.
Royalty Service Corp. 1 Marlow, 8-2s-14w, drilling in sand 6,572 ft., elev. 381 ft.
Texas 7 Smith, 7-2s-14w, drilling 7,773 ft. in black shale, top Nodular shale 7,237 ft., top second Nodular 7,715 ft., elev. 200 ft.
Rosecrans, Los Angeles County: R. S. Lytle 1 Anderson, 1-3s-14w, drilling 6,860 ft. in sand and shale, elev. 232 ft.

LOS ANGELES BASIN WILDCATS

Centinella district, Los Angeles County: Cliff Baker 1 L. A. I., 29-2s-14w, cleaning out 6,560 ft. in sand and shale, elev. 102 ft.
Chino district, San Bernardino County: Prado Pet. Corp. 1 Lamp, 31-2s-7w, drilling 708 ft. in surface sand, elev. 560 ft.
Coyote West district, Orange County: Wilshire-Annex 1 Comm., 14-3s-11w, drilling 6,475 ft. in sand and shale, being drilled by Rocky Mountain Drilling Co.
East Santa Fe Springs district, Los Angeles County: Sierra Pet. Co. 1 Cole, 2-3s-11w, building rig.
Manhattan Beach district, Los Angeles County: Dominguez Ext. Oil Co. 1 Sunset, 19-3s-14w, rig erected over old well of Sunset Oil Co. abandoned at 7,865 ft ft., cleaning out 4,690 ft., elev. 135 ft.
Palos Verdes district, Los Angeles County: Newton Dev. Co. 1 P. V., 13-5s-15w, drilling 1,493 ft. in sand and shale with cable tools.
Puente district, Orange County: Sunset Oil Co. 1 Baldwin, 11-2s-11w, rig erected.

Upper Zones to Be Tested At Raisin City Field

Shell Oil Co., Inc., is not losing any time in determining the importance of its discovery in the Raisin City section of Fresno County as the company has already spudded in 1-19 Santa Ana and Fresno Land and is at present rotating ahead at 4,480 ft. This is only a few hundred above the top of the upper oil sand found in the Santa Margarita at 4,688-4,727 ft. and which is the objective of the present well. The importance of this wildcat area is still undetermined but the outcome of the well now being drilled may go a long way toward establishing the productive possibilities of the upper zone.

The lower zone in which the well was finished only showed about 25 bbl. of oil and 15,000,000 cu. ft. of gas per day which tends to indicate the existence of a gas cap at this particular point. The crude oil tested 36-gravity which puts it in a normal grade of crude oil and not a condensate. The well now being drilled by Shell is located south of the discovery well and consequently the log may indicate which way the structure is dipping. The status at present is the possible existence of a new oil field which may extend in any one of several directions, one drilling well and one well shut in.

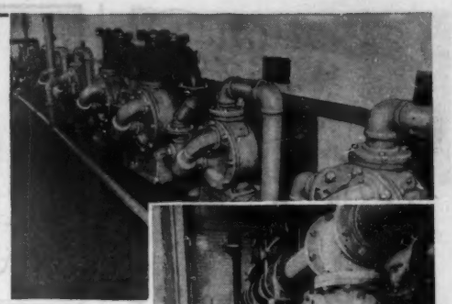
Preparations Under Way for Transfer Of Elk Hills to Navy Department

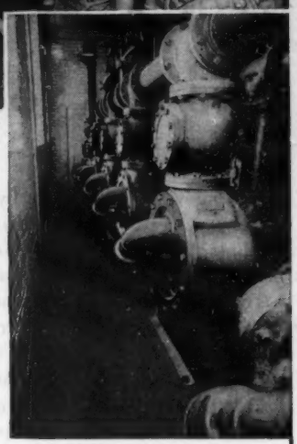
The announcement of Secretary Ickes in Washington on June 19 that the Navy Department was taking possession of Section 16 in the Elk Hills field, Kern County, California, was nothing new to California operators. General Petroleum Corp. several months ago indicated that it would not attempt to hold its title to the acreage in question. This field has been a source of more trouble to operators than any 10 others due to political machinations which cost Standard Oil Co. the loss of Section 36 in addition to about $7,000,000 for the value of oil and gas extracted. Standard offered this property to the Navy at one time and the latter was not interested but later when production had been found became very much interested.

Standard has indicated its desire to convey its Elk Hills acreage to the Navy but this time it will be on the basis of what its fee lands hold from a production standpoint. Accordingly Standard is at present drilling several outposts to form a definite basis for condemnation. No estimate is available with respect to Standard's future expectancy from its acreage at Elk Hills but it is possible that it may exceed $50,000,000. The announced intention of the Navy Department is to shut in all production as soon as it comes into possession of the Hills and maintain this as a future reserve. The first of several leases held at Elk Hills by Richfield Oil Corp. expires in July and the re-

(Continued on Page 122)

We SOLD Them The FIRST VIKING Installation . . . . They INSISTED On The SECOND!





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Among the Drilling

HUNTER & ROBERTS of Abilene have spudded a scheduled Palo Pinto wildcat in northern Jones County, West Central Texas. The test is for the M.C.L. Corp. and is its 1 Swanson & Swenson, 660 ft. from the north and 467 ft. from the west lines of Section 187, B.B.B.&C. Survey, on a block assembled by G. M. Heinzelmann of Snyder.

BUFFINGTON & SMITH have been contracted by Frank Darden, Longview, Tex., operator, to drill a 1,400-ft. Nacatoch sand test in the townsite of Big Sandy in Upshur County, eastern Texas. The wildcat, Darden's 1 C. E. Kay, is located in the Carson Survey.

SANDERS BROTHERS, of Artesia, Tex., together with Culbertson & Irwin of Midland, Tex., are preparing to spud a 2,500-ft. rotary wildcat in Eddy County, southeastern New Mexico. The test is the 1 DeTemple, 660 ft. out of the SW cor. 27-19s-31e.

VIVIAN P. CANNON, chief drilling superintendent for W. I. (Bill) Lewis, drilling contractor of Salem, Ill., is being treated in a hospital at St. Louis, Mo., for injuries received in an automobile accident recently. He is expected to be confined to the hospital for another 6 weeks.

CROW Drilling Co., Shreveport, La., has two important wildcat contracts in North Louisiana and Arkansas. In West Carroll Parish, the company will drill a 7,000-ft. wildcat located on the east flank of the Monroe uplift. The Arkansas Fuel Oil Co. has awarded contract to the company to deepen 1 McGaughey, in the Stephens area of Ouachita County, Arkansas; the latter test was carried to 3,320 ft. with a light rig, and after showing oil at a shallow level, plans were completed for deepening it with a heavier Crow rig.

TRINITY Drillers, San Antonio, Tex., received contract from Union Oil Co. of California for 1 M. and C. Volpe, a projected 6,000-ft. wildcat located north of the Pescadio townsite in Webb County, Texas. Other operations are reported in the La Rosa field, Refugio County, Texas, for Norsworthy Production Co., and in Jim Hogg County, Texas, where a wildcat is being drilled for Snowden & McSweeney.

ARROW Drilling Co., Houston, Tex., received contract from Sinclair Prairie Oil Co. for an 11,000-ft. wildcat to be drilled in the Bourg area, Terrebonne Parish, Louisiana, and the rig is being moved to the location.

CROSBY Drilling Co., Houston, Tex., is reworking Providence Oil Co. 1 Hatfield, the discovery well of a new field, 2½ miles west of Clodine, Fort Bend County, Texas, and the rig is expected to be moved, after the workover is completed, to the same company's 1 Settegast, a wildcat located about 3 miles west of the discovery. On the south flank of the Ville Platte field, Evangeline Parish, Louisiana, a rotary is being moved in for a Wilcox test which will be drilled jointly with T. J. Markley.

SULTANA Drilling Co. drilled the H. R. Scivally 1 Tensas Delta, a new Wilcox field discovery located in southern La Salle Parish, North Louisiana. The rig used was a new light unit. The wildcat has not yet been officially completed, but has flowed 15 bbl. hourly on a ¼-in. choke with no salt-water production.

ALLEN & MORRIS, San Antonio, Tex., have apparently opened a new field or a major extension to the Chapman Ranch field, Nueces County, Texas, as Seaboard Oil Co. 9 Chapman showed for a producer on a drill-stem test in sand at 4,200 ft., and the well is drilling ahead to a contract depth of 6,500 ft. In Calhoun County, Texas, drilling was started in the Jay Welder field for Coronado Corp., while in Jim Wells

R. B. Hancock, production superintendent; H. C. Cannon; George Treat; Harper Duncan; C. B. Robinson, driller; Coy A. Clay, A. L. Foster, and C. J. Landry, day drilling crew, Shell Oil Co., Inc., West Lake Verret field

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Contractors

County, Texas, 2 Dunlap, located in the East Premont area, was recently spudded for Transwestern Oil Co. Other activity is reported in the Alta Mesa field, Brooks County, Texas, for Standard Oil Co. of Texas, in Nueces and San Patricio counties, Texas, for the Pantex Oil Co., and W. R. R. Oil Co., while in the East Texas district, one rotary is running for the Tide Water Associated Oil Co.

PIONEER Drilling Co. has moved its headquarters from Salem to Mount Vernon, Ill., and will open offices in the K. P. Building as soon as the building is remodeled. J. E. Burden and Walter G. Tschudin, owners of the contracting firm, have both established residence in Mount Vernon, moving from Flora, Ill.

GEORGE ECHOLS, Houston, Tex., is nearing the 8,200-ft. sand on the east flank of the Pine Prairie dome, Evangeline Parish, Louisiana, in 1 Wexler, being drilled for Titanic Oil Co. In the Johnson Bayou, Cameron Parish, Louisiana, rig has been moved in for 1 Cameron Parish School Board which will be drilled jointly with John Mayo.

PARKER Drilling Co., Houston, Tex., has cemented casing on 2 Wilberts, located about 1,320 ft. east of the discovery well of the newly opened Port Allen field, West Baton Rouge Parish, Louisiana, and the well is scheduled to be completed during the week. Location has been made for 3 Wilberts, and the rig is expected to be moved in after the present well is completed.

PROSPECT Drilling Co., Houston, Tex., was preparing to test H. E. Williams 1 Houston Land & Trust Co., located 1 mile north of the Lochridge field, Brazoria County, Texas. A drill-stem test in the regular 6,300-ft. sand recovered several hundred feet of oil.

BIG WEST Drilling Co., of Dallas, Tex., has the contract to drill a Smackover lime wildcat in Lafayette County, Arkansas, for Tide Water Associated Oil Co. and Seaboard Oil Co., 6½ miles west of the McKamie field.

BEN FRENCH, drilling superintendent for Gordon Oil Co., has been transferred from Illinois to a well being drilled by the company in the Reed City pool of Osceola County, Michigan. Gordon moved in a rotary from Illinois fields last week, its first rotary operation in Michigan.

IDEAL Drilling Co., Oklahoma City, has the contract for a Wilcox sand or 4,200-ft. test from Hall-Jordan Oil Co. and Homer Hurst to be drilled north of Wewoka in Seminole County, Oklahoma, in NW SE SE 8-8-8.

DELANEY Drilling Co., Ada, Okla., has the contract for a Wilcox sand or 4,200-ft. test in Payne County, Oklahoma, to be drilled by Thomas E. Berry on fee land in NW NE SW 13-18-3. The location is on a block of 580 acres, with E. C. Duncan having an interest in the well.

PARKER Drilling Co., Tulsa, last week ran 150 sacks of cement at 5,200 ft. on the Gulf Refining Co. 1 Bateson in Bay County, Michigan, in an attempt to shut off gas and water that has been breaking through. The 7-in. casing had been gun perforated at 5,200 ft. for a secondary cement job. Michigan's deepest test at present is bottomed in the top of the Niagaran at 8,273 ft., where 7-in. casing is cemented.

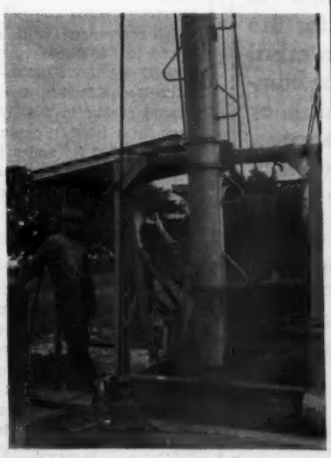
CREEKMORE Drilling Co., Tulsa, which drilled the discovery well in the Zenith pool, Stafford County, Kansas, are still one of the most active contractors in the field. To date they have drilled approximately 70 wells in the field for Stanolind Oil & Gas Co. and last week had completed an interesting edge well in Volk 1 McComb, N½ NE NE 22-24-11.

HANNUM Drilling Co., Oklahoma City, Okla., has the contract for an Arbuckle dolomite test in southwest Phillips County, Kansas, for Aladdin Petroleum Co. and others. The well is 1 Wiltrout, S½ SE NE 18-5-20w.

AMERICAN Drilling Co., Saginaw, Mich., last week was awarded contract for drilling two Michigan wells, one in Isabella County and the second in Oceana County. The Isabella well will be drilled for L. & S. Drilling Co. in the Deerfield gas area; the Oceana well is to be drilled in the Crystal pool for John H. Davis.

ROTARY Drilling Co., San Antonio, Tex., has received contract for drilling an Illinois well and two wells in Southwest Texas fields. In White County, Illinois, the firm will drill on the Hon lease for First National Petroleum Trust. In Southwest Texas one well will be drilled for Brewer-Hixon Oil Co. on the Annabel Sugg's land in Refugio School Survey, in Live Oak and Bee counties; a second will be drilled for Lewis Production Co. in Jim Wells County, a twin location to the 1-A Adams.

GILLESPIE & MOORE, Holdenville, Okla., drilled the Wilcox sand discovery well at the Otoe City pool in Noble County, Oklahoma, for Superior Oil Corp., which was being tested last week. The well was Superior 1 Faubian, SE SW SE 16-22-1.



Paul Young (driller) and Olney Blackburn (tool dresser) of Matthews-Story Drilling Co. going in the hole with a swab on a well in the Benton field of Illinois

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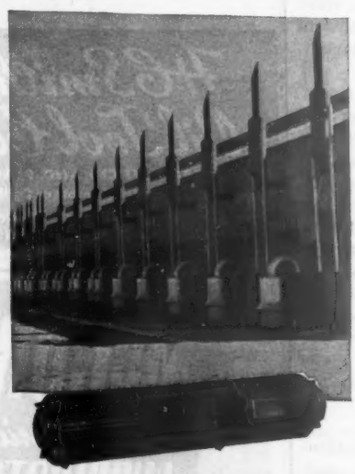

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LOUISIANA GULF COAST

West Flank Production Found At Bayou Choctaw Field

By F. L. SINGLETON

NEW ORLEANS, La., June 23.—A scheduled production test of a promising wildcat located on the Bayou Sale prospect, St. Mary Parish, and the opening of flank production on the west side of the Bayou Choctaw field, Iberville Parish, held the attention of Louisiana Gulf Coast operators the past week.

Humble 1 E. F. Martin, a prospective pool opener located on the Bayou Sale prospect, St. Mary Parish, has been plugged back from a total depth of 12,487 ft. to 10,900 ft., and casing is expected to be perforated at intervals from 10,066-10,120 ft., where an electrical log is reported to have recorded favorable indications. This well has been drilled extremely tight, and details of the core record and electrical survey were not available. The well is situated in the southern part of the parish, several miles north of the Bateman Lake field on a block of several thousand acres centering in 16-16s-9e.

SUMMARY OF COMPLETIONS

	No.	Bbl.	Footage
Oil wells: Fields	14	3,032	111,969
Dry holes: Fields	5	.....	46,352
Wildcats	2	.....	23,392
Total	21	.....	181,713

BAYOU CHOCTAW FIELD.—West-flank production was assured the Bayou Choctaw field, Iberville Parish, by the showing of Texas 1 H. J. Levy. Drilled to a total depth of 8,880 ft., casing was perforated at 8,507-82 ft., and the well flowed 65 bbl. of oil in 14 hours through a ¼-in. choke. Screen and liner was being set and a potential test was scheduled to be made at the close of the week. This is the deepest test ever drilled on the west flank which heretofore was thought condemned by two tests, both of which were abandoned below 6,100 ft. Development of the structure has been largely confined to the north, east, and southeast flanks, and the deepest production has been on the north flank where several wells are flowing from sand at 8,200-8,300 ft.

LAKESIDE FIELD.—A north extension of approximately 3,200 ft. was promised the newly opened Lakeside field, Cameron Parish, by the blowout of Superior Oil Co. of California 1 Calcasieu National Bank. The blowout occurred at a depth of 10,422 ft., which stuck the drill stem and the company is fishing for same. An electrical log showed gas sand from 9,868-9,938 ft., which corresponds with one of the gas-distillate sands logged in the discovery well.

PORT ALLEN FIELD.—In the Port Allen field, West Baton Rouge Parish, Amerada Petroleum Corp. has cemented casing in 2-A Wilberts which is expected to mark up a 1,320-ft. extension to the field. Total depth is below 9,700 ft., and a production test is slated to be made in the 9,600-ft. discovery pay, although a shallower sand at 9,200 ft. and 9,400 ft. showed evidence of production. With the completion of this well, the rig will be moved about 1,500 ft. south of the discovery well where location was made for 3 Wilberts in 26-7s-11e.

WELSH DOME.—The new sand recently opened on the south flank of the Welsh dome, Jefferson Davis Parish, was defined to the west with the abandonment of Union Sulphur Co. 2 Bourgeois at a depth below 7,000 ft. This abandonment is located about 300 ft. west of the company's 1 Bourgeois, completed for a good producer several weeks ago in sand at 6,500 ft. Additional development is being started by the company.

GUEYDAN FIELD.—On the southeast flank of the Gueydan field, Vermilion Parish, Union Sulphur Co. 2 J. B. Baker is bottomed at 10,154 ft., and casing has been cemented for a production test of sand at 9,982-10,090 ft. which was logged by an electrical survey. Four other tests drilling in the area are nearing their objectives and should be nearing the completion stage by the first of the week.

VILLE PLATTE.—Another important extension was indicated for the Ville Platte field, Evangeline Parish, as R. A. Irwin 1 Johnson, an outpost several hundred feet southeast of production, was being prepared for completion. Total depth of the well is 10,184 ft., and sand showing oil was reported to have been topped in the Wilcox at 10,060 ft. Recent developments around the south and southeast edges of the structure have opened considerable acreage for development, and the field continues to be the most active field in the district.

PINE PRAIRIE DOME.—Two wells located on the east flank of the Pine Prairie dome, Evangeline Parish, were nearing the 8,200-ft. sand. Titanic Oil Co. 1 Wexler was drilling below 7,500 ft., while Stanolind 1 Ardoin was drilled below 7,400 ft. Both wells are important offsets to the discovery well, and the importance of this new strike will soon be determined.

LOUISIANA GULF COAST COMPLETIONS

WILDCATS

Iberia Parish: Gulf 1 Petit Anse Co., dry, T.D. 12,063 ft.
Terrebonne Parish: Stanolind 1 Realty Operators, dry, T.D. 11,329 ft.

FIELDS

Anse La Butte, St. Martin Parish: Glassell et al 1 Denbo, dry, T.D. 6,176 ft.
Iberia 5-A Moresi, 48 bbl., pumping, T.D. 1,250 ft.
Barataria, Jefferson Parish: California 12-A Unit, 292 bbl., 5/32-in. choke, perf. casing 7,640-46 ft., T.D. 8,240 ft.
Bayou Des Allemands, La Fourche Parish: Amerada 5 State, 227 bbl., 14 hr., ¾-in. choke, perf. casing 10,190-10,208 ft., T.D. 10,508 ft.
Bayou Pigeon, Iberia Parish: Plymouth 1 Brownell-Drews, 308 bbl., ½-in. choke, perf. casing 8,144-56 ft., T.D. 8,156 ft.
Convent, St. James Parish: Continental 3 Realty Operators, dry, T.D. 9,495 ft.
East Hackberry, Cameron Parish: Stanolind 25 Cameron Parish School Board, 261 bbl., ¾-in. choke, T.D. 9,711 ft.
Texas 26-B State, 275 bbl., ½-in. choke, T.D. 8,030 ft., P.B. T.D. 7,849 ft.
Eola, Avoyelles Parish: Gulf 7 Moullere, 195 bbl., 5/32-in. choke, perf. casing 8,540-55 ft., T.D. 8,555 ft.
Garden Island, Plaquemines Parish: Texas 51 State, 195 bbl., 5/32-in. choke, perf. casing 6,398-6,425 ft., T.D. 7,116 ft.
Jennings, Acadia Parish: Superior 16 William Lockett, 43 bbl., 18 hr., 12/64-in. choke, perf. casing 8,448-53 ft., T.D. 9,612 ft.
Lake Mongoulois, St. Martin Parish: Texas 10 State, dry, T.D. 8,827 ft.
New Iberia, Iberia Parish: Texas 20 State, 325 bbl., ¾-in. choke, perf. casing 6,150-6,203 ft., T.D. 7,736 ft.
South Roaneke, Jefferson Davis Parish: Continental 1 Tietje, dry, T.D. 10,480 ft.
Sulphur, Calcasieu Parish: Union Sulphur 778 fee, 65 bbl., 18/64-in. choke, T.D. 5,111 ft., P.B. T.D. 5,053 ft.
Ville Platte, Evangeline Parish: Continental 1 Tate-Becker, 490 bbl., ¾-in. choke, perf. casing 10,088-10,110 ft., T.D. 10,329 ft.
Continental 2 Ed Tate, 67 bbl., ¾-in. choke, perf. casing 8,885-8,905 ft., T.D. 9,200 ft.
West Lake Verrett, St. Martin Parish: Shell 1 Salt Domes, dry, T.D. 11,372 ft.
Shell S8 Jeanerette, 241 bbl., 12/64-in. choke, perf. casing 8,402-10 ft., T.D. 8,415 ft.

LOUISIANA GULF COAST DRILLING REPORT

Beauregard Parish: Humble 1-B Edgewood Land & Logging Co., 25-6s-10w, drilling sandy shale 10,682 ft.
Atlantic 1-D Rice Land & Lumber Co., 30-4s-10w, top Wilcox 9,332 ft., drilling shale 9,800 ft.
Calcasieu Parish: Pan American 1 Louisiana Farm & Livestock Co., 8-11s-9w, drilling shale 2,570 ft.
Orleans Parish: W. T. Burton 2 L.&N.R.R., drilling shale 8,625 ft.
Plaquemines Parish: Phillips 1 L.L.&E., 38-20s-29e, drilling shale and sand 8,210 ft.
Rapides Parish: Chambles & Pitts 1 Lee Lumber Co., 6-5n-3e, drilling sandy shale 4,930 ft.
St. Martin Parish: Texas 17 St. Martin Land Co., Plumb Bob field, 21-8s-7e, drilling shale 7,862 ft.
Superior 2 E. C. Stuart, Section 28 dome, drilling shale 11,256 ft.
Terrebonne Parish: Sinclair Prairie 1 A. J. Dupiantis, 12-18s-18e, first report.
Vermilion Parish: Cities Service Co. 1 Homeseekers Development Co., 11-11s-1e, T.D. 10,505 ft., recovered drill stem to 10,022 ft., drilling by remainder of drill stem.
A. Delcambre et al 1 Ludovic Landry, 54-13s-5e, drilling 110 ft.

Third Pay Zone Is Opened in Frio at West Ganado Field

By NEIL WILLIAMS

HOUSTON, Tex., June 23.—A mile-north extension to the Lochridge field, Brazoria County, was indicated last week as H. E. Williams et al prepared to test 1 Houston Land & Trust Co. Casing was being cemented for completion following a 5-minute drill-stem test at 6,330-37 ft., the total depth, which recovered 1,500 ft. of oil, and tested 60 lb. working pressure. The Discorbis was topped at 5,603 ft., Heterostegina at 5,907 ft., and the Marginulina at 6,060 ft. The well is situated in the A. Robbins Survey, and its completion for a producer is expected to result in additional development for the structure which heretofore has been developed largely by Gulf Oil Corp. and Shell Oil Co., Inc.

FORT BEND COUNTY.—Providence Oil Co. 1 Hatfield, the discovery well of a new field, 2½ miles west of Clodine, Fort Bend County, has been killed and the well is being retested through perforated casing at 7,499-7,502 ft. Production was originally opened from the Yegua sand at 7,497-7,503 ft. On the initial test the well flowed 60 bbl. of fluid per day through a 9/64-in. choke, of which 20 per cent was salt water and the balance pipe-line oil. On strike with this well and located about 3 miles to the west, the same company has derrick up for 1 J. J. Settegast in the Joel McCrary Survey.

WEST GANADO FIELD.—The potentiality of the West Ganado field, Jackson County, was enlarged as Pure Oil Co. opened production from a third sand in the Frio formation as two wells on the west and southwest sides of the structure were completed for average producers. These wells, 3 Spacek and 1 Dr. J. R. Craven, were drilled below 6,200 ft. and were plugged back and completed in sand at 4,700 ft. after production test in the lower sands recovered oil and salt water. Based on top of the Frio sand at 4,692 ft. and 4,698 ft., both wells are practically flat with each other, which indicates that this new sand may be found productive over the entire west and southwest sides of the field. The new sand is the shallowest of three sands which are found at 5,200 and 5,900 ft.

MAURBRO FIELD.—With a major extension recorded on the southeast side of the Maurbro field, Jackson County, location for another outpost well, 1 mile east of production, was announced by Magnolia Petroleum Co., which is moving in material for 1 Vordick in the C. Branch Survey. The extension producer, 3,000 ft. southeast of production, was finaled by Wheelock & Collins with the completion of 1 McCroy, completed in the regular 5,200-ft. sand as one of the best producers in the field.

RED FISH REEF.—On the north side of the Red Fish Reef, offshore from Chambers County in Galveston Bay, Gulf Oil Corp. was rebuilding derrick over 2-R-224 State, which was destroyed by a blowout the past week. The well blew out while the drill stem was being pulled from the hole at a total depth of 4,957 ft., and it blew dry gas and mud for several hours before the hole bridged, shutting off the flow. This is the first trouble experienced in developing the structure and the blowout apparently opens a shallow sand for the field which has not been logged in previous wells. To the southeast, Humble 20-A-248 State was flowing pipe-line oil while cleaning out from perforated casing at 9,348-58 ft. Total depth is 10,683 ft.

LEAGUE CITY FIELD.—On the northwest side of the League City field, Galveston County, Phillips 5 Stewart Title Guaranty Co. was drilled to a total depth 10,400 ft. with no shows logged in the basal Frio pay, and the company was plugging back to test a shallow sand at 3,500 ft. which was logged as a gas sand by an electrical log.

LAKE CREEK FIELD.—In the Lake Creek field, Montgomery County, and located about 4,000 ft. southwest of the discovery well, Superior Oil Co. of California 2 McWhorter was bottomed at 9,780 ft. and a series of sidewall cores were being cut. The well is expected to be drilled to a depth of 10,000 ft. before casing is cemented to test several showings of oil and gas already logged in the Wilcox formation below 8,600 ft. To the southeast in the Tamina area, David B. MacDaniel 1 Baldwin was being retested through perforated liner at 9,935-45 ft. after squeezing off perforations at 9,934-44 ft. where the well swabbed salt water.

MONTGOMERY COUNTY.—In the same county and located in the Willis area, Continental Oil Co. was reported to be ready to move in material for its Wilcox test located on the Hale lease in the De la Garza Survey. In the eastern part of the county near the Liberty County line, location for another Wilcox test is expected to be announced for the Fostoria block located north of the Splendora gas field.

SUMMARY OF COMPLETIONS

	No.	Bbl.	Footage
Oil wells: Lolita	2	119	10,591
West Ranch	2	312	11,525
Other fields	17	5,328	115,373
Dry holes: Fields	3	.....	16,755
Wildcats	1	.....	8,134
Total	25	.....	162,378

WILDCAT COMPLETIONS

Matagorda County: Magnolia 1 Northern Ranch, dry, T.D. 8,154 ft.

FIELD COMPLETIONS

Anahuac, Chambers County: Navarro 1 Porter, 631 bbl., ¼-in. choke, perf. casing 7,090-7,123 ft., T.D. 7,125 ft.

Bay City, Matagorda County: R. Y. Smith 1 C. M. Gaines, dry, T.D. 8,160 ft.

Boling, Fort Bend County: Mackhank 15-C E. C. Farmer, 498 bbl., ¼-in. choke, top sand 4,341 ft., T.D. 4,403 ft.

Dyersdale, Harris County: Jack Frazier 1 Van Ezzell, 254 bbl., ¼-in. choke, perf. casing 4,053-71 ft., T.D. 4,080 ft.

Esperson, Liberty County: General Crude 16-E Esperson, 708 bbl., ¼-in. choke, perf. casing 7,535-89 ft., T.D. 7,754 ft.

Fannett, Jefferson County: Gulf 7-E Marrs McLean, 744 bbl., ¼-in. choke, perf. casing 8,345-89 ft., T.D. 8,552 ft.

Garwood, Colorado County: W. R. Davis Co., Inc., 2-B L. E. Brownston, 315 bbl., ⅞-in. choke, perf. casing 6,104-09 ft., T.D. 6,157 ft.

Lolita, Jackson County: Magnolia 18 Mitchell, 94 bbl., ¼-in. choke, sand 5,288-91 ft.
Skelly 3 Mitchell, 13 bbl. 8 hr., 7/64-in. choke, perf. casing 5,279-95 ft., T.D. 5,300 ft.

Lovells Lake, Jefferson County: Humble 28 Broussard, 140 bbl., ½-in. choke, T.D. 7,800 ft.

Maubro, Jackson County: Humble 3 Bonnet, 384 bbl., ¼-in. choke, sand 5,220-26 ft.
R. L. Wheelock 1 McCroy-Westhoff, 485 bbl., ¼-in. choke, perf. casing 5,216-26 ft., T.D. 5,281 ft.

Old Ocean, Brazoria County: Harrison & Abercrombie 1 Aaron-Arp, 269 bbl., ¼-in. choke, top sand 9,998 ft., T.D. 10,450 ft.
Shell 1 Reynolds, 99 bbl., ⅞-in. choke, perf. casing 10,106-10,124 ft., T.D. 10,500 ft.

Port Neches, Orange County: Phillips 6 W. H. Stark, 125 bbl., ⅛-in. choke, sand 3,450-3,510 ft., T.D. 4,700 ft.

Saratoga, Hardin County: Crown Central 1 Teel, dry, T.D. 2,975 ft.

Tomball, Harris County: Humble 3-C Jurgens, dry, T.D. 5,620 ft.

Vienna, Lavaca County: W. McMurray 1 A. C. Allen, 45 bbl., 5/32-in. choke, perf. casing 8,468-71 ft., T.D. 8,523 ft.

West Ganado, Jackson County: Pure 1 J. R. Craven, 110 bbl., 9/64-in. choke, perf. casing 4,755-65 ft., T.D. 6,278 ft.
Pure 3 F. Spacek, 97 bbl., ⅛-in. choke, perf. casing 4,755-65 ft., T.D. 6,285 ft.

West Ranch, Jackson County: Magnolia 161-A West, 471 bbl., ¾-in. choke, perf. casing 5,758-63 ft., T.D. 5,764 ft.
Magnolia 162-A West, 52 bbl., 4 hr., ⅞-in. choke, perf. casing 5,752-56 ft., T.D. 5,761 ft.

West Silsbee, Hardin County: Republic 2 Elliott-fee, 308 bbl., ¼-in. choke, sand 6,853-59 ft.

Withers, Wharton County: Texas 97-C Pierce, 116 bbl., ½-in. choke, perf. casing 5,360-68 ft., T.D. 5,369 ft.

WILDCAT DRILLING REPORT

Chambers County: H. E. Williams et al 1 Trinity Disposal Co., T.&N.O.R.R. Sur., 45, drilling shale 2,835 ft.
Jackson County: Erwin & Johnson 1 Vesely, J. Davis Sur., drilling sand 5,375 ft.
Jefferson County: Humble 2 W. C. Baird, D. F. Howard Sur., T.D. 6,562 ft., fishing.
Humble-Shell 1 W. L. Gallier, T.&N.O.R.R. Sur. 347 dredging slip for drilling barge.
McDannald Oil Co. 1 Hebert Trust, P. H. Bell Sur., drilling shale and lime 6,012 ft.
Lavaca County: Herton Oil Co. 1 Hohmann, William Taylor Sur., S.D. 4,034 ft.
Polk County: Jordan Drilling Co. 1 Kirby Petroleum Co., I.&G.N. Sur., Sec. 25, drilling shale and lime 6,575 ft.
Wharton County: Barnsdall 1 Wallace-Hancock, L. L. Miller Sur., Sec. 6, moving in material.
Sinclair Prairie 1 H. R. Carlson, E.T.R.R. Sur., Sec. 65, drilling shale 1,580 ft.

Kentucky Fields

(Continued from Page 99)

Boyd Knox and Brown 4 I. T. Rogers, South Fork, 10 bbl.
Albert Briar 4 Park Vanderpool, on Millers Creek, 10 bbl.
Wolfe County: Campton 9 Anna Rose, 5 bbl. depth not available.
Martin County: Virginian Gasoline & Oil Co. 7 W. H. Blankenship, dry at 1,150 ft.

GAS WELL COMPLETIONS

Floyd County: Kentucky-West Virginia Gas Co. 5300 Solomon Akers, on Branham Branch, 1,122,000 cu. ft. gas at 2,823 ft. in shale, R.P. 385 lb.
Kentucky-West Virginia Gas Co. 620 M. A. Davidson, on Daniels Creek, 582,000 cu. ft. of gas, R.P. 376 lb. at 2,589 ft. in shale.
Pike County: Kentucky-West Virginia Gas Co. 614 John B. Leslie, Caney Creek of Johns Creek, 64,000 cu. ft. of gas, shale at 3,061 ft.

EASTERN KENTUCKY DRILLING REPORT

Pike County

Kentucky-West Virginia Gas Co. operations:
613 N. J. Boyd, 2,315 ft., Berea.
615 A. H. Blackburn, Jones Creek, 1,633 ft., lime.
618 T. H. Blackburn, Johns Creek, 1,289 ft., sand.
621 R. B. Taylor, Brushy Fork, 1,470 ft., Big lime.
5302 James W. Bevins, Sloane Branch, 2,260 ft., Injun.

Knott County

Inland Gas Corp. operations:
220 Hindman Settlement School tract, Smith Branch of Carr Creek, 2,207 ft., Big lime.
223 Virginia-Kentucky Coal Corp., Balls Fork, building rig.
Kentucky-West Virginia Gas Co. operations:
616 Lark Slone, Jones Fork, 1,964 ft., Big lime.
5304 Benjamin Smith, 2,485 ft., shale.
5306 Levisa Thacker, Mill Creek, 1,439 ft., Salt sand.
5308 William Trippiett, Long Fork of Johns Branch, 1,370 ft., Salt sand.
5312 A. Johnson, 1,235 ft., sand.
5315 Richard Hall, 1,685 ft., Big lime.

Floyd County

Kentucky-West Virginia Gas Co. operations:
622 F. M. Rice, rigging up.
623 Nelson Boyd, Hunts Fork of Frazier Creek, 1,300 ft., sand.
625 Ben Burgs, Daniels Creek, 977 ft., sand.
629 Joseph Hall, 1,300 ft., Salt sand.
630 J. W. Bates, 1,450 ft., Salt sand.
631 Gordy Walker, rigging up.
632 M. A. Davidson, Daniels Creek, idle.
634 Thomas Fitzpatrick, 590 ft., slate.
5301 James C. Jones, 1,525 ft., sand.
5305 John Hamilton, Mitchell Fork, 2,040 ft., Maxon.
5307 James Stratton, Shop Branch, 2,715 ft., shale.
5309 T. T. Hendricks, Cow Creek, 1,300 ft., slate.
5310 Martha Alley, Frazier Creek, 1,000 ft., slate.
5311 James Osborne, Osborne Branch, 1,250 ft., sand.
5314 A. R. Music, 1,000 ft., Salt sand.
5316 H. V. Akers, Pigeon Roost of Branham, 1,224 ft., sand.

WESTERN KENTUCKY

Daviess County

Red Hill district: United Petroleum Co. 4 Perry Thomas 80 bbl., 130-qt. shot, stray and Jett sands 876-1,006 ft.
J. S. Smith et al 3 Lon Nally, dry, T.D. 1,133 ft.
Utica district: Daugherty 11 Rex O'Flynn, 500,000 cu. ft. gas, Barlow sand 1,320-27 ft., completed as pressure well.
Miller 11 Gus Morgan, cleaning out, 60-qt. shot, Jones sand 1,269-79 ft., T.D. 1,289 ft.
Cane Run School district: Cumberland 11 W. E. Ivy completed water-intake well, T.D. 525½ ft.
Birk City district: J. C. Barnett et al 1 G. S. Smith, dry, T.D. 1,375 ft.
Jess Ashby 1 C. E. Jagoe, old dry hole reopened, 60-qt. shot, Bethel sand 1,358-82 ft., testing.

Hancock County

Saunders School district: Hupp 1 U. B. Church Parsonage, dry, T.D. 420 ft.
Pellville district: Leeper Oil Co. 9 Ira Jett, 10 bbl., 90-qt. shot, Barlow sand 708-25 ft.
Burt Thompson et al 1 Thomas Jackson, drilling at 800 ft.

Henderson County

Hebbardsville district: Hupp 5 Otto Busby (King-Pruitt-Min.), rigging up.

McLean County

Southwest Livermore district: Ellis 6 Stevens heirs, 17 bbl., 100-qt. shot, Barlow sand 1,370-92 ft., T.D. 1,395 ft.
Hupp 5 Livermore Timber Co., rigging up.

Ohio County

Beda district: Miller & Steele 1 H. T. Jones, dry, T.D. 746 ft.
Southeast Livermore district: Farmer et al 4 Livermore Timber Co., dry, T.D. 1,412 ft.
Pleasant Grove Church district: Joe S. May et al 12 A. R. Renfrow, dry, T.D. 333 ft.
Pleasant Ridge district: Wilbur Wilkins et al, 2 Addie Westerfield, moving in.

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FORGED-STEEL GEARS have uniform metal density. They're strong, tough, right for long, heavy-duty service. There are no treacherous hidden blow holes in them, no unseen shrinkage cracks. They are free from the excess internal stresses that can cause serious operating inefficiency and breakdown.

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No welds at critically-stressed sections.

Rubber-mounted connection of walking beam to provide protection from well shocks on smaller units.

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Trenton Lime Wells Holding Production Up at Salem

By STAFF CORRESPONDENT

MATTOON, Ill., June 23.—Three years ago, on June 21, one of the greatest oil strikes in the history of the industry was reported, the discovery of the Salem field of Marion County. The discovery of the pool at Texas 1 Tate, NW NW 5-1n-2e, opened one of the most intensive drilling campaigns ever seen. No. 1 Tate had an initial daily production of 1,068 bbl., flowing from the Benoist sand topped at 1,728 ft. After its discovery, production in the field rapidly increased until, at the peak, the pool was producing 300,000 bbl. daily, ranking second only to the East Texas field. At the present time daily production is approximately 90,000 bbl., and the pool still holds its rank as the second largest single producing area in the nation.

Today the field covers an area of approximately 16 sq. miles and has yielded 140,000,000 bbl. of oil. Of this total production, 53,000,000 bbl. were produced during the past year which saw a Devonian drilling boom gradually fade. Each time in past, however, as drilling activity began to fade, a new discovery in the field touched off a drilling campaign more intense than the one before. At present, the field is undergoing Trenton exploration and, although it has lacked the colorful campaign that characterized the development of the Devonian, the horizon is being steadily developed and may have a greater effect than has yet been realized. All the new Trenton wells, although comparatively small producers, are reported to be maintaining their daily production with scarcely any decline. As a result, the field's newest and deepest producing horizon may be expected to add many years of life to the productiveness of the area.

The Salem field has six producing horizons and 2,388 producing wells at present. The producing horizons are the Benoist and Aux Vases sands, McClosky, St. Louis (Salem), Devonian and Trenton limes.

June 21 also is the anniversary date of the Irvington pool of Washington County. This pool was discovered 1 year ago, and on the same day W. C. McBride completed 9 Carson as the largest producer ever drilled in Illinois. No. 9 Carson, a Devonian well in the Centralia field, flowed 3,735 bbl. in 6 hours, a production of 14,940 bbl. a day.

SUMMARY OF COMPLETIONS

	No.	Bbl.	Footage
Oil wells: Benton	7	2,223	15,005
East Patoka	2	444	2,747
Mount Carmel	3	340	6,122
North Enterprise	3	433	9,070
North New Harmony	8	1,606	22,428
Roland	4	882	9,280
West Liberty	2	816	5,655
Other pools	17	1,724	38,655
Wildcats	1	10	360
Dry holes: Fields	8	.....	19,323
Wildcats	13	.....	21,020
Total	68	.....	149,665
Recompletions	15	1,228	.....

Allendale 1, Dundas 1, Mill Shoals 1, Mount Carmel 1, Patoka 1, Roland 1, Russellville 2.

Hamilton County Wildcat Shows For Commercial Well

A Hamilton County wildcat, Jack Chevigny 1 Phillips, SW NW SW 26-6s-6e, was reported swabbing between 30 and 40 bbl. of oil and an equal amount of water late last week. Meanwhile at a nearby wildcat, Texas Co. was preparing to perforate casing opposite the Benoist and Aux Vases at 1 Shasteen, NE SE NW 27-6s-6e. These wells may prove to be extension wells of the Hoodville pool or they may open a new pool for the county.

WHITE COUNTY.—In White County, 3½ miles south of Maunie, Magnolia 1 Higgins, NW SW SE 24-6s-10e, swabbed 814 bbl. of oil in 19 hours from the Tar Springs sand at about 2,160-75 ft. No. 1 Higgins is an offset to Cherry & Kidd 1 Mary Prell and is the largest producer yet completed in the recently discovered Maunie area.

Edwards County Wildcat To Test Benoist

An Edwards County wildcat 2 miles east of production at the north end of the Albion field early last week set casing for a production test of the Benoist at 2,850-66 ft. National Petroleum Co. 1 Crackle heirs, NW NW SW 5-2s-14w, was bottomed at a total depth of 3,152 ft. through a dry McClosky and plugged back to the Benoist following an electrical survey. The 16 ft. of Benoist saturation encountered previously had shown 85 ft. of oil and mud and no water during 1-hour drill-stem test.

WILDCAT COMPLETIONS

Bond County: Bragassia 1 DeMonlin, SW SE NW 34-7n-2w, dry at 1,129 ft., base Pennsylvanian 826 ft., Golconda 828 ft., Cypress 892 ft., Cypress sand 918-64 ft., Paint Creek 1,007 ft., Aux Vases 1,061 ft., Ste. Genevieve 1,120 ft.

Champaign County: Union Prod. Pet. 1 C. Kirby, NW SE SW SW 20-20n-10e, dry at 1,400 ft., New Albany 190 ft., Devonian 277 ft., Maquoketa 1,040 ft., Trenton 1,240 ft.

Union Prod. Pet. 1 Walt, NW SE SW 7-20n-10e, dry at 374 ft., Osage 205 ft., Hannibal 255 ft., Rockford 271 ft., New Albany 287 ft., Devonian 369 ft.

Edgar County: Zink 1 Kirkham, SW NW SE 14-2n-14w, pumped 10 bbl., sand 302½-22 ft., 340-60 ft., T.D. 360 ft. *Pool Opener.*

Hamilton County: Weinert 1 Clark, S½ SW NE 32-3s-5e, dry at 3,446 ft., Menard 2,428 ft., Vienna 2,543 ft., Tar Springs 2,575 ft., Glen Dean 2,717 ft., Hardinsburg 2,750 ft., Golconda 2,817 ft., Barlow 2,920 ft., Cypress 2,934 ft., Cypress sand 3,032 ft., Benoist 3,110 ft., Aux Vases 3,222 ft., Ste. Genevieve 3,250 ft., Rosiclare 3,309 ft., Fredonia 3,360 ft., McClosky 3,371 ft.

Jackson County: G. Hass et al 1 J. B. Bechtloff, S½ SW NE 5-8s-2w, location abandoned.

Jefferson County: Kingwood 1 Landis, SE SE NW SE 17-2s-1e, dry at 2,278 ft.

Macoupin County: O. G. Hayes 1 Alderson, SE SE NE 17-12n-7w, dry at 522 ft., water sand 480-85 ft., 516-22 ft.

Moultrie County: Olson Drlg. 1 Ekiss, 31-14n-4e, dry at 2,773 ft., Devonian 2,768 ft.

Randolph County: Anderson et al 1 S. Carney, SW NW NE 21-7s-7w, dry at 608 ft.

J. R. Rankin 1 B. Bierman, SW SW SE 3-7s-5w, dry at 1,208 ft.

Gode & Murphy 1 McIntyre, SW SW SW 10-5s-5w, dry at 1,094 ft., Menard 485 ft., Tar Springs 581 ft., Glen Dean 640 ft., Cypress 853 ft., Cypress sand 860 ft., Benoist 991 ft., Aux Vases sand 1,054-94 ft.

St. Clair County: Alspach 1 Boyle, SE SE SW 31-3s-6w, dry at 585 ft., Aux Vases 562 ft.

Washington County: C. A. Smith 1 Mittendorf, SW SW SE 8-2s-4w, dry at 2,450 ft.

White County: L. B. Jackson 1 Hanna, NE NE NE 28-5s-10e, dry at 3,153 ft.

Williamson County: I. Hodges 1 Nicholson, NE SE NW 21-10s-4e, location abandoned.

FIELD COMPLETIONS

Clay County

Sailor Springs: C. Robinson 2 Tolliver, NW NW SE 26-4n-7e, pumped 262 bbl., 10-qt. shot 2,326-37 ft., 15-qt. shot 2,326-40 ft., Tar Springs 2,322-40 ft., T.D. 2,342 ft.

Clinton County

Bartelso: C. H. Kreigh 2 Kampwerth, SE NW NW 8-1n-3w, pumped 5 bbl. oil and 2 bbl. water, 10-qt. shot 993-1,000 ft., Cypress 990 ft., T.D. 1,007 ft.

Effingham County

Mason: Benson 1 Hardsock, SE NW NE 22-6n-5e, location abandoned.

Fayette County

Louden: H. Luttrell 2 Buzzard, SW NE SE 34-9n-3e, location abandoned.

H. Luttrell 3 Buzzard, SE NE SE 34-9n-3e, location abandoned.

D. B. Lesh 1 Williams, SE SW SE 27-8n-3e, pumped 63 bbl. oil and 25 bbl. water, 40-qt. shot 1,541-81 ft., 10-qt. shot 1,591-95 ft., Benoist 1,591-97 ft., Paint Creek 1,562-83 ft., T.D. 1,597 ft.

Franklin County

Benton: Adkins 6 C. W. & F., SE SE SE 25-6s-2e, pumped 373 bbl., 30-qt. shot 2,120-41 ft., Tar Springs 2,109 ft., T.D. 2,146 ft.

Adkins 11 C. W. & F., NE SE SW 25-6s-2e, pumped 430 bbl., 30-qt. shot 2,132-60 ft., Tar Springs 2,131 ft., T.D. 2,160 ft.

Adkins 12 C. W. & F., NW SE SW 25-6s-2e, pumped 407 bbl., 40-qt. shot 2,132-64 ft., Tar Springs 2,127 ft., T.D. 2,164 ft.

Adkins 13 C. W. & F., SE SE SE 25-6s-2e, pumped 375 bbl., 30-qt. shot 2,118-26 ft., Tar Springs 2,098 ft., T.D. 2,126 ft.

Wegener 1 Chenault, NE NW SE 25-6s-2e, pumped 284 bbl., 30-qt. shot 2,130-40 ft., Tar Springs 2,125 ft., T.D. 2,140 ft.

Adkins 4 Orient R, SE SE NE 26-6s-2e, pumped 204 bbl., 10-qt. shot 2,115-27 ft., Tar Springs 2,107 ft., T.D. 2,127 ft.

Howell 3 Minier, NE SE NE 36-6s-2e, pumped 150 bbl., 40-qt. shot 2,126-42 ft., Tar Springs 2,108 ft., T.D. 2,142 ft.

Gallatin County

Inman: Phillips 6 Egyptian Tie & Timber, NW SE NE 16-8s-10e, pumped 140 bbl. oil and 6 bbl. water, 20-qt. shot 2,069-77 ft., Tar Springs 2,060 ft., T.D. 2,077 ft.

Hamilton County

Hoodville: Sinclair 8 Friel-B, SE NW SE 34-5s-6e, pumped 145 bbl., 7-qt. shot 3,051-58 ft., Aux Vases 3,051-58 ft., old well deepened from 2,969-3,059 ft.

Carter 5 Strubinger, N½ SE NE 27-5s-6e, pumped 117 bbl. oil and 24 bbl. water, 1,000 gal. acid, McClosky 3,144-53 ft., 3,204-06 ft., 3,218-20 ft., T.D. 3,234 ft., P.B. 3,220 ft.

Dahlgren: DeKalb 3 Scrivener, N½ NE SW 27-3s-5e, pumped 395 bbl., 7,000 gal. acid, Ste. Genevieve 3,164 ft., T.D. 3,309 ft.

Jasper County

West Liberty: Pure 2 Craig Consol., W½ NW SW 20-5n-10e, flowed 695 bbl. through 1-in. choke, 5,000 gal. acid, McClosky 2,797-2,805 ft., 2,823-27 ft., T.D. 2,840 ft.

Pure 3 J. W. Hovey-A, E½ SW NE 17-5n-10e, pumped 121 bbl., 5,000 gal. acid, McClosky, 2,780-85 ft., 2,788-90 ft., 2,793-95 ft., T.D. 2,815 ft.

Lawrence County

Hardinville: J. C. Cannon 1 Ridgely, SE SW SW 1-2n-12w, pumped 15 bbl. oil and 15 bbl. water, natural, sand 277-312 ft., T.D. 313 ft.

Russellville: Frontier 5 Gillespie, NE SE SW 13-4n-11w, dry at 1,194 ft., Buchanan 1,071 ft., H.F.W. Kentucky Nat. Gas 1 Havill, SE NE 19-4n-10w, dry at 1,108 ft., Bridgeport 808 ft., Buchanan 1,049-1,082 ft., shaly sand 1,088-1,100 ft., water sand 1,100-08 ft.

Marion County

Tonti: Absher & Booth 4-B McMackin, W½ NW SW 34-3n-2e, pumped 40 bbl., 10-qt. shot 2,022-27 ft., Aux Vases 2,005 ft., T.D. 2,027 ft.

East Patoka: Magnolia 3 Peddicord, SE NW SE 34-4n-1e, pumped 150 bbl. oil and 5 bbl. water, 20-qt. shot 1,362-67 ft., Weller 1,354-67 ft., T.D. 1,368 ft.

Shell 9 Davidson, SW SE NE 34-4n-1e, pumped 294 bbl. oil and 4 bbl. water, 19-qt. shot 1,358-73 ft., Paint Creek 1,353-79 ft., T.D. 1,379 ft.

Patoka: Adams O. & G. 22-D-T Merryman, NE SE SW 21-4n-1e, dry at 3,142 ft., Devonian 2,865 ft., tested water, to use well for water disposal.

Salem: Magnolia 28 W. B. Young, NE SW NE 20-2n-2e, pumped 26 bbl. from Lower Devonian, pay 3,465-80 ft., T.D. 3,740 ft.

Texas 16 R. Friedrich, SE SW NW 29-2n-2e, swabbed 60 bbl., natural, Trenton 4,522 ft., old well deepened to 4,636 ft.

Texas 13 Dunning, NE SE SE 30-2n-2e, pumped 37 bbl., natural, Trenton 4,510 ft., old well deepened to 4,622 ft.

Texas 31 K. Wayman, NW NE NE 31-2n-2e, flowed 156 bbl., natural, Trenton 4,515 ft., old well deepened to 4,627 ft.

Texas 18 Foriesner, SE NE NW 32-2n-2e, pumped 14 bbl. natural, Trenton 4,480 ft., old well deepened to 4,585 ft.

Richland County

Dundas: Pure 3 M. Bauman, W½ SE SE 12-4n-9e, dry at 2,950 ft., P.B. 2,886 ft., Glen Dean 2,385 ft., Cypress sand 2,550 ft., Ste. Genevieve 2,886 ft., Rosiclare 2,904 ft., Fredonia 2,916 ft.

Noble: P. Hoffman 1 Hanna, N½ N½ NW SE 17-3n-9e, pumped 18 bbl., 15-qt. shot 3,064-72 ft., old well deepened from 2,972-3,095 ft.

St. Clair County

Dupo: Tarleton Oil 1 Reichert, NW NW NW 34-1n-10w, pumped 100 bbl. oil and 700 bbl. water, 1,000 gal. acid, Trenton 648 ft., T.D. 711 ft.

Wabash County

Allendale: Snowden-McSweeney 1 Armstrong et al, NW SW SE 9-1n-12w, pumped 35 bbl., 40-qt. shot 2,005-18 ft., Cypress sand 2,004-18 ft., T.D. 2,018 ft.

Sian Oil 1 E. Smith, SW SW NE 9-1n-12w, dry at 2,324 ft., Biehl 1,471 ft., Menard 1,515 ft., Waltersburg 1,550 ft., Tar Springs 1,630 ft., Glen Dean 1,742 ft., Hardinsburg 1,805 ft., Golconda 1,816 ft., Barlow 1,939 ft., Cypress sand 1,970 ft., Benoist 2,103 ft., Renault 2,140 ft., Aux Vases 2,160 ft., Ste. Genevieve 2,192 ft., Rosiclare 2,273 ft., McClosky 2,301 ft.

Mount Carmel: Ill.-Mid-Cont. 1 G. Reeves, SE NW SE NE 20-1s-12w, pumped 90 bbl., 30-qt. shot on bottom, Cypress sand 2,046-56 ft., T.D. 2,056 ft.

Roberts 1 Coleman, NE SE SW NE 20-1s-12w, pumped 130 bbl., 20-qt. shot on bottom, Cypress sand 2,026-32 ft., T.D. 2,040 ft.

O'Meara Bros. 8 Gould, SW NE SE 17-1s-12w, dry at 2,362 ft.

O'Meara 1 Coleman, SE SW NE 20-1s-12w, location abandoned.

W. F. Lacy 1 John, NW NE NW SW 21-1s-12w, pumped 120 bbl. oil and 5 bbl. water, 30-qt. shot on bottom, Cypress sand 2,013 ft., T.D. 2,026 ft.

Washington County

Irvington: Risk & Powell 1 Holle, NW NW NE 15-1s-1w, pumped 168 bbl., natural, Benoist sand 1,515 ft., T.D. 1,527 ft.

Wayne County

North Enterprise: Pure 1 E. R. Hosselton-C, NW NE NE 31-2n-8e, pumped 11 bbl., 5,000 gal. acid, McClosky 2,988-91 ft., 2,998-3,001 ft., 3,011-13 ft., T.D. 3,015 ft.

Pure 2 Hosselton-B, SE NW NE 31-2n-8e, pumped 302 bbl., 5,000 gal. acid, Fredonia 2,996 ft., T.D. 3,025 ft.

Sanders et al 8 Hubble, NE NW NE 31-2n-8e, pumped 120 bbl., 5,000 gal. acid, Rosiclare 2,955 ft., T.D. 3,030 ft.

Boyleston: Weinert 1 Bright, N½ NW NE 2-2s-7e, pumped 10 bbl., 500 gal. acid, 1,000 gal. reacid, perf. 3,160-73 ft., Aux Vases 3,160-73 ft., old well P.B. from 3,335-3,201 ft.

White County

Burnt Prairie: New Penn. Dev. 3 C. R. Whitlow, SW NW SW 28-3s-9e, pumped 60 bbl. oil and 51 bbl. water, 5,000 gal. acid, McClosky pay 3,435-40 ft., old well deepened from 3,428-3,440 ft.

Mill Shoals: Weinert 5 Miller Bros. et al, SW SE NE 30-3s-8e, pumped 150 bbl., Aux Vases 3,195-3,229 ft., T.D. 3,321 ft.

Spiller et al 2 Gray, SW SW NE 19-3s-8e, dry at 3,382 ft., Menard 2,425 ft., Glen Dean 2,630 ft., Golconda 2,770 ft., Barlow 2,883 ft., Renault 3,192 ft., Aux Vases 3,215 ft., Ste. Genevieve 3,280 ft., Rosiclare 3,313 ft., Fredonia 3,335 ft., McClosky 3,339 ft.

Roland: Lewis Prod. 1 Mitchell, NE NE SW 11-7s-8e, flowed 306 bbl., natural, Waltersburg 2,161-75 ft., T.D. 2,175 ft.

Sinclair 1 McKenzie, SW NE SE 11-7s-8e, swabbed 244 bbl., natural, Waltersburg 2,164 ft., T.D. 2,184 ft.

Sinclair 1 Mitchell, SE NW SE 11-7s-8e, pumped 111 bbl., 10-qt. shot 2,162-69 ft., 10-qt. shot 2,159-66 ft., Waltersburg sand 2,148 ft., T.D. 2,169 ft.

Kingwood-Sinclair 1 McKenzie, SE NW SW 12-7s-8e, swabbed and flowed 221 bbl., 10-qt. shot 2,746-54 ft., Benoist 2,736-52 ft., T.D. 2,752 ft.

Eason Oil 1 Bryant, NW SW NW 13-7s-8e, dry at 2,861 ft., P.B. 2,570 ft., Waltersburg sand 2,179-84 ft., Tar Springs sand 2,253 ft., Cypress 2,562 ft., Paint Creek 2,695 ft., Benoist 2,722-2,802 ft., Ste. Genevieve 2,859 ft.

East Calvin: Buell & Herndon 11 J. Bond, NW SW SE 5-4s-14w, pumped 35 bbl. oil and 10 bbl. water, 100-qt. shot 2,850-74 ft., 250-qt. shot 2,848-73 ft., Aux Vases 2,846-74 ft., T.D. 2,875 ft.

Pure 4 Calvin-A, SW NE NW 9-4s-14w, flowed 74 bbl., 85-qt. shot 2,813-43 ft., 35-qt. shot 2,699-2,711 ft., Aux Vases 2,812-35 ft., Paint Creek 2,693 ft., T.D. 2,843 ft., P.B. 2,711 ft.

Pure 14 E. B. Potter, NE NW NW 9-4s-14w, flowed 89 bbl., 80-qt. shot 2,815-45 ft., 30-qt. shot 2,688-98 ft., Aux Vases 2,813-37 ft., Paint Creek 2,682 ft., T.D. 2,845 ft., P.B. 2,698 ft.

North New Harmony: Superior 5 H. C. Ford, NE NW SW 23-4s-14w, pumped 416 bbl., 43 per cent salt water, 60-qt. shot 2,648-65 ft., 400-qt. shot 2,650-65 ft., Cypress sand 2,588-2,620 ft., 2,644-65 ft., T.D. 2,665 ft.

Superior 3 S. R. Stanley, SW SW NW 27-4s-14w, pumped 285 bbl., 2 per cent salt water, 50-qt. shot 2,712-25 ft., 230-qt. shot 2,710-25 ft., Benoist 2,712-72 ft., T.D. 2,856 ft., P.B. 2,775 ft.

Superior 18 H. M. Ford, N½ N½ S½ 28-4s-14w, pumped 175 bbl., 600-qt. shot 2,683-2,738 ft., perf. 2,588-2,611 ft., Cypress 2,588-2,612 ft., Benoist 2,677-2,728 ft., T.D. 2,728 ft.

Sun 4 Henning, NW SW NW 33-4s-14w, pumped 35 bbl. oil and 20 bbl. water, 70-qt. shot 2,704-33 ft., Benoist sand 2,699-2,733 ft., T.D.

Superior 11 E. M. Fitton-A, SE NW NW 33-4s-14w, pumped 225 bbl., 120-qt. shot 2,834-50 ft., 400-qt. shot 2,835-44 ft., perf. 2,702-74 ft., Cypress 2,568-2,617 ft., T.D. 2,850 ft.

Tide Water 21 Dennis, N½ NE SE NE 33-4s-14w, swabbed 120 bbl. oil and 28 bbl. water, 50-qt. shot 2,819-46 ft., 50-qt. shot 2,711-38 ft., Aux Vases 2,821-40 ft., Benoist 2,696-2,749 ft., T.D. 2,846 ft.

Superior 8 Ford et al-D, NE SW NW 34-4s-14w, pumped 200 bbl., 120-qt. shot 2,812-42 ft., perf. 2,113-28 ft., Cypress sand 2,562-2,613 ft., Benoist 2,694-2,750 ft., Aux Vases 2,810-37 ft., T.D. 2,920 ft.

Superior 9-D H. C. Ford et al, NE NW NW 34-4s-14w, pumped 150 bbl., 140-qt. shot 2,802-36 ft., 400-qt. shot 2,805-36 ft., perf. 2,719-33 ft., 2,562-2,605 ft., Cypress 2,563-2,611 ft., Benoist 2,713-48 ft., Aux Vases 2,806-30 ft., T.D. 2,836 ft.

South New Harmony: Benedum-Trees 2 Golden, NE NE SE 29-5s-14w, pumped 10 bbl. oil and 140 bbl. water, McClosky 3,011-22 ft., 3,031-35 ft., T.D. 3,059 ft., P.B. 3,035 ft.

New Harmony: Bradley et al 2 Findh, NE NE NE 7-5s-14w, location abandoned.

ILLINOIS DRILLING REPORT

Bond County: Schwarz 1 Studebaker, SE SE SW 21-6n-2w, Louisiana lime 2,119 ft., Osage 1,562 ft., Chattanooga 2,148 ft., coring 2,232 ft.

K. Woolsey 1 Chester Sapp, NE NE SW 22-5n-4w, set 4-in. 602 ft., T.D. 640 ft. (corrected depths), putting on pump.

Champaign County: Union Prod. Pet. 1 James, SE SW SE 18-20n-10e, Osage 139 ft., Rockford 156 ft., New Albany 173 ft., Devonian 258 ft., Silurian 331 ft., 5-in. 250 ft., waiting on cement.

Christian County: W. Marlow 1 Howell, SE SE NE 26-15n-2w, Ste. Genevieve 998 ft., drilling 1,000 ft.

Clinton County: A. W. Gerson 1 Hy Bilkhart, SW NW NW 22-1n-5w, T.D. 2,451 ft., running electrical log.

Du Page County: I. C. R. Syndicate 1 Bartlett Village, SE NW NW 2-40n-9e, St. Peter 724 ft., drilling 910 ft.

Edgar County: Monarch Oil 1 Pinnell, SE SE SW 14-12n-14w, drilling 405 ft.

Zink et al 1 Hunt, NE NE NE 14-12n-14w, S.D. in sand 335 ft.

Edwards County: Nat. Pet. 1 Crackle heirs, NW NW SW 5-2s-14w, Hardinsburg 2,501 ft., Golconda 2,595 ft., Barlow 2,728 ft., Cypress 2,770 ft., Paint Creek 2,844 ft., Benoist 2,854 ft., saturated, Renault 2,912 ft., Aux Vases 2,967 ft., Aux Vases sand 2,989 ft., Ste. Genevieve 2,997 ft., 1-hr. D.S. test 2,853-72 ft., received 1,350 ft. gas, 80 ft. oily mud, 5 ft. free oil, T.D. 3,150 ft., running casing.

Smokey Oil 1 A. B. Chalcraft, W½ NE NW 19-2s-10e, rig, first report.

Fayette County: Bremo Dev. 1 Mahan, SE SW NW 3-5n-3e, Glen Dean 1,685 ft., Cypress sand 1,870 ft., drilling 1,875 ft.

J. T. Elmore 1 Keith, SE NE NW 18-6n-1w, S.D. 700 ft.

Turner Drlg. 1 Williams, SW SW NW 6-6n-2e, drilling 1,850 ft.

H. R. Spires 1 Braasch, NE NE SW 1-5n-2e, S.D. 365 ft.

Franklin County: Yingling & Hayes 1 Murphy Pearce, W½ SE SW 35-4s-3e, location, first report.

Yingling & Hayes 1 Viehl, E½ NE SW 12-5s-3e, location, first report.

Gallatin County: Blackstock 1 Cox, NE NW SW 2-8s-9e, McClosky 2,840-45 ft., 2,855-60 ft., 2,870-79 ft., 2,989-94 ft., 1,500 gal. acid, 3,500 gal. reacid, swabbed 3½ bbl. oil and ⅛ bbl. water an hr., T.D. 3,020 ft., cleaning out.

Ryan et al 1 Crunk, N½ NE NW SE 9-8s-9e, Paint Creek 2,701-14 ft., drilling 2,805 ft.

Hamilton County: Ohio 1 First Nat. Bank of Enfield, SE SE NW 3-5s-7e, first report, rigging up rotary.

Ryan Oil 1 Hunt, SE SE NE 28-6s-7e, Ste. Genevieve 3,176 ft., drilling 3,252 ft.

Texas 1 C. Johnson, W½ NE NE 34-6s-6e, moving in rotary tools.

Henry County: O. Behrens 1 Patton, SE SE SW 1-17n-3e, set 6-in. 820 ft., drilling 820 ft.

Jackson County: Barton & Shipman 1 P. Maharry, NE NE SE 20-9s-3w, Salem 1,785 ft., S.D. 1,815 ft.

Jasper County: C. L. Erbin 1 H. Garner, SW NW SE 16-6n-8e, sand 365-425 ft., drilling 500 ft.

Johnson County Harding & Hariowe 1 Roy McCuan, NE NW NE 26-11s-3e, S.D. 708 ft.

Lawrence County: W. Payne 1 H. Payne, NW SW NW 20-3n-11w, T.D. 1,848½ ft., testing.

Macoupin County: Adams & Laegers 1 Bristow, SW SW SW NW 8-11n-7w, S.D. 1,435 ft.

McDonough County: C. H. Harrison et al 1 G. Bowman, SW SW NW 19-4n-4w, drilling 890 ft.

Madison County: F. C. Kiskadden 1 G. A. Fischer, S½ SE SW NE 27-5n-8w, S.D. 1,286 ft.

Alch & Carroll 1 Rinkel, SE NE NW 33-5n-6w, S.D. casing 1,508 ft.

Marion County: Texas 1 McClelland, S½ SW NE 18-2n-2e, location, first report.

Montgomery County: H. C. Detrick 1 W. H. Barnes, NW NE SE 20-10n-2w, set 5-in. 2,300 ft., drilling 2,209 ft.

Pulaski County: R. G. Williams et al 1 W. L. Richey, NE SE SW 9-15s-1e, drilling 1,252 ft.

Richland County: J. Davis 1 S. C. Shan, W½ SW NW 27-3n-9e, T.D. 3,095 ft., pumped 60 bbl. in 8 hr., testing.

St. Clair County: Gus Kunze 1 McCurdy, SE SW SW 29-3s-6w, drilling 634 ft.

Magnolia 1 M. Probst, SE SE SE 2-2s-9w, set 10-in. 215 ft., drilling 407 ft.

G. Morris 1-A V. Rasp, NW NW SW 32-2n-7w, T.D. 1,578 ft., drill pipe stuck.

Burgess 1 Eidman, NW SW SE 18-1s-6w, drilling 245 ft.

Saline County: Carter & Vaughn 1 H. Roberts, SE SW NE 6-8s-7e, S.D. 1,365 ft.

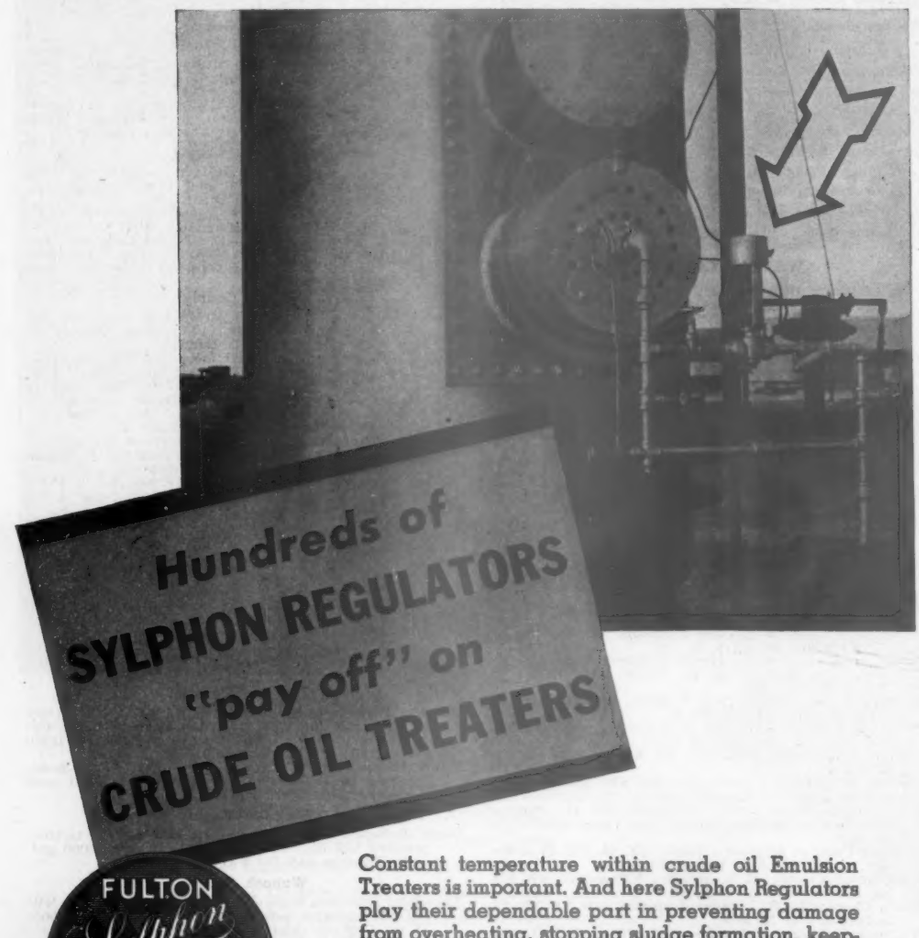
Shelby County: Olson Drlg. 1 Atkinson, E½ SE SE 12-13n-3e, first report, drilling 1,250 ft.

Oil, Inc., 1 Barkhurst, SW SW NE 7-10n-3e, set 8-in. 70 ft., drilling 1,650 ft.

Tazewell County: Bartelmay 1 Mathis, SW NW SW 24-25n-3w, drilling 1,485 ft.

Wabash County: E. O. Olds et al 1 Parkinson, NW NW SW NE 29-1s-12w, Glen Dean 1,779 ft., Golconda

(Continued on Page 117)



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Mountain Operators Seeking Public Land Royalty Limit

By T. R. INGRAM

DENVER, Colo., June 23.—Operators in the Rocky Mountain area expecting difficulties in obtaining casing for wells on account of defense production are either stocking up with supplies or curtailing drilling operations in anticipation of shortage. Some companies foreseeing difficulties have acquired or have orders in for all equipment and supplies for the season's requirements.

Oil men in Denver express belief Secretary of Interior Ickes will soon establish maximum royalty of 12½ per cent on the public domain to aid development. Warwick M. Downing, Colorado member interstate oil compact committee, was summoned to Washington, and laid proposal before the secretary prior to meeting with oil men.

SUMMARY OF COMPLETIONS

Wyoming

	No.	Bbl.	Footage
Oil wells: Fields	2	500	8,257

Montana

	No.	Bbl.	Footage
Oil wells: Fields	4	310	10,117
Dry: Fields	3	.....	4,765
Total	7	.....	14,882

Completions for the week were mostly routine. R. G. Parrant 1 Holbrook, northwest of Kevin-Sunburst, which was reported a discovery 2 weeks ago, made 20 bbl. a day on the pump, 44-gravity oil. Mountain Fuel Supply 8-A Wilson, East Hiawatha field, Colorado, a near completion, pumped 196 bbl. in 24 hours from middle Wasatch sand.

Deep test on Canyon Creek, Sweetwater County, Wyoming, north of the Hiawatha district, will be drilled by West States Petroleum Co. Middle fault block at Frannie showed water in Amsden sand in Stanolind 21-X Rosenberg, with some saturation above. It will be carried to the Madison and tested, then drilled into the Madison. North and south blocks are productive.

COLORADO DRILLING REPORT

El Paso County: F. F. Hintze 1 State, CEL SE SE 16-11s-60w, drilling 2,150 ft., carrying 6⅝-in., est. 300,000 cu. ft. gas at 1,980 ft.
La Plata County: E. B. Klem 1 Olbert, NW SW 9-35n-12w, drilling 4,095 ft.
N. Spatter 1-X Bryce, C SW SW 31-33n-9w, T.D. 4,428 ft., cementing caves at 3,800 ft.
Moffat County: Mountain Fuel Supply 8-A Wilson, C SE NE 22-12n-100w, T.D. 2,534 ft., pumped 196 bbl. in 24 hr. from middle sand, near completion.
Mountain Fuel Supply 3-A Musser, CNL NW SW 5-11n-97w, T.D. 5,700 ft., 7-in. at 3,697 ft., will perf. at 5,276-83 ft. and test.
Mountain Fuel Supply 1 Lasher, NW NE NE 25-12n-101w, West Hiawatha, old gas well preparing to deepen from 2,755 ft. to test sands which yield oil on East Hiawatha.
Pueblo County: E. A. Scriven 1 Kieffer, SE SW 21-21s-66w, S.D. 106 ft.
Rio Blanco County: Texas-California 6 Unit, NW NE SE 27-3n-94w, coring and testing in Morrison sand at 6,459 ft.
Buford Oil 1 Government, C SW SW 16-1n-91w, T.D. 4,387 ft., crew gone in, repairing road to resume, will run 4-in. to bottom.

WYOMING COMPLETIONS

Lance Creek, Niobrara County: Continental 13 Otto Rohiff, SE SE SE 31-36n-65w, 360 bbl. of oil and 840 bbl. of water, in Leo sand, T.D. 5,273 ft., 7-in. at 5,190 ft.
Salt Creek, Natrona County: Stanolind 4-SD-3, NE NW SW 26-40n-79w, flowed 140 bbl. in 24 hr. through 7/64-in. choke on 2-in. tubing with 540 lb. back pressure from third Sundance sand, T.D. 2,984 ft., top of sand 2,960 ft., old well in second Wall Creek deepened from 1,550 ft.

WYOMING DRILLING REPORT

Big Horn County: Ohio 2-A Hoskins, SE SE SE 15-56n-97w, drilling 3,318 ft.
Campbell County: Continental-Texas Gulf 1 Knapp, NE SW SE 4-56n-69w, T.D. 4,402 ft., fishing.
Carbon County: Sinclair-Wyoming 5-C Mahoney, C NW SE 34-26n-88w, T.D. 4,566 ft., P.B. to 4,458 ft., cleaning out to shoot.
Sinclair-Wyoming 5-F Mahoney, C NE NW 34-26n-88w, spudded.
Sinclair-Wyoming 22-A Wertz, CEL SE SE 1-26n-90w, drilling 3,545 ft. in new hole, top Sundance 4,120 ft. in old hole.
Sinclair-Wyoming 23-A Wertz, NE NE NE 12-26n-90w, drilling 4,795 ft., top Frontier 2,330 ft.
Sinclair-Wyoming 20 Wertz, NE SW NE 7-26n-89w, drilling 5,648 ft., top Alcova 4,765 ft.
Fremont County: Indian Oil 3 Tribal, NW SW NW 23-6n-2w, rigging cable tools.
Valentine M. Kirk 3 Tribal, NW NW SW 23-6n-2w, drilling 311 ft., 12¼-in. at 69 ft.
Sinclair-Wyoming 3-A Unit, NW NW NE 3-33n-92w, rigging up.
Natrona County: General Petroleum 31-27-P, NW NE NW 27-35n-77w, T.D. 4,594 ft., top Shannon 4,562 ft., cleaning out and testing.
General Petroleum 3-16-S (State), NW SW NW 16-35n-77w, spudded.
Stanolind 3-SD-3, NE NW NE 26-40n-79w, T.D. 2,398 ft., rigging to deepen to Sundance, old Lakota sand well.
Niobrara County: Ohio 10 A. Rohiff, SW NE 32-36n-65w, spudded, first report.
Ohio 19 Lamb, CSL NW NE 5-35n-65w, rigging up, first report.
Continental 3-A Schuricht, C SW NW 5-35n-65w, T.D. 5,272 ft., testing, flowing and swabbing 18 bbl. per hr.
Ohio 4 R. & C., NE SW 32-36n-65w, T.D. 5,203 ft., cemented 7-in. at 5,201 ft., perf. 100 shots at 5,104-77 ft., swabbed 229 bbl. oil and 12 bbl. water in 12 hr.
Park County: Texas 5 Sonners, SE NE NE 30-51n-100w, T.D. 3,460 ft., 8⅝-in. at 3,288 ft., acidized 2,000 gal., testing.
Stanolind 21-X Rosenberg, NE SW NW 25-58n-98w, S.D. 2,834 ft., in Amsden, D.S. test at 2,758-85 ft. open 30 min. showed 558 ft. water.
Sweetwater County: Rocky Mountain Drilling 1 State, SW SW SW 36-20n-104w, drilling 6,380 ft. in Tensleep, top 6,239 ft.
West States Pet. 1 Unit, C SE SE 10-12n-101w, Canyon Creek, rig, contract to Manning & Martin, Inc.
Gus Pograntz 1 Clark, C NW NE 22-14n-104w, drilling red beds at 5,270 ft., will go to Tensleep.
Sinclair-Wyoming 101-A, NW NW NW 11-26n-90w drilling 2,605 ft., top Lakota 1,720 ft.
Sinclair-Wyoming 100-A, NE NE NE 10-26n-90w, T.D. 3,936 ft., cemented 7-in. 3,918 ft., top Tensleep 3,914 ft.
Sublette County: Texas 1-L Government, SW SW SW 27-27n-113w, cemented 10-in. at 80 ft., first report.
Marvel Oil 1-A Government, NE 33-27n-113w, spudded, first report.
Marvel Oil 1-L Government, SE SE SE 28-27n-113w, T.D. 1,197 ft., P.B. to test sand at 1,130-55 ft.

MONTANA COMPLETIONS

Cut Bank, Glacier County: Glacier Production 5 Lookhoff, SE SW SE 33-33n-5w, swabbed 110 bbl. first 24 hr., T.D. 2,880 ft., Cut Bank sand 2,840-80 ft., main pay 2,862-80 ft.
Glacier Production 7 Van Ormer, CSL NW SE 8-33n-5w, swabbed 82 bbl. first 24 hr., T.D. 2,875 ft., P.B. to 2,873 ft., good show oil in Sunburst 2,840-73 ft., Cut Bank sand 2,840-73 ft., main pay 2,866-75 ft.
Consolidated Gas 2 Frary-Tribal-191, NW SW NE 19-32n-5w, swabbed 98 bbl. 24 hr., T.D. 2,779 ft., Cut Bank sand 2,724-70 ft., main pay 2,753-70 ft.
Kevin-Sunburst, Toole County: Montana-Dakota Utilities 319 Stevens, C NE SW 29-34n-1w, water at 1,223 ft., T.D., P.B. and abandoned.
E. Morton 3 Ellingson, CNL NE NW 23-35n-3w, plugged and abandoned at 1,724 ft., after shot without results.
Ramona Oil 4 Government, NE NE NW 12-35n-3w, show oil in contact at 1,803-06 ft., would not take acid, will abandon.
Superior Pet. 4 Haugen, SE NE NE 11-35n-3w, pumped 20 bbl. per day from Sunburst at 1,583-93 ft.

MONTANA DRILLING REPORT

Fallon County: Carter 1 Northern Pacific Unit, C SE SW 19-4n-62e, drilling 5,885 ft. in dolomite.
Garfield County: California Co. 4 Charles, C SE NW 21-15n-30e, drilling 4,785 ft.
Glacier County: Ralph N. Davis 1 Tribal, NE NE NE 25-32n-6w, spudded.
Kulberg Oil 1 Tribal, NE NE NE 24-32n-6w, cemented 10¾-in. 620 ft., top Colorado 595 ft.
Glacier Prod. 7 Miller, CWL SE NE 32-33n-5w, rig, first report
Glacier Prod. 1 Walburger Unit, SW SW NE 18-33n-4w, location, first report.
Consolidated Gas 1 Frary-Tribal-208, NE NE SW 19-32n-5w, rig, first report.
Par Oil 1 Tribal-200, NE NE SE 13-32n-6w, spudded, first report.
A. E. Crumley 1 Tribal, NW SW NE 29-32n-5w, top Colorado 365 ft., cemented 10¾-in. 410 ft.
R. C. Jeffries 1 Tribal-201, NE SE NE 30-32n-5w, spudded.
K. D. Pardee 1 Tribal-210, SW SE NW 13-32n-6w, spudded.
Texas 1 Government, C NW SW 8-32n-5w, spudded.
Hill County: A. B. Cobb 1 Government, SE SE NE 19-27n-15e, drilling 4,300 ft.
Edwards & Callison 1 Hansen, SW SE NW 25-33n-15e, cemented 7-in. on bottom at 1,205 ft.
Liberty County: Montana-Dakota Utilities 1 Oswood, C NE SW 18-35n-4e, drilling 1,385 ft., 10-in. at 224 ft.
Western Natural Gas 1 Herbert, 28-37n-4e, spudded, first report.
Teton County: R. C. Tarrant 1 Kellogg, SW NW NE 33-27n-5w, S.D. 2,580 ft.
Toole County: Big West 1 Carlson, NE NE NE 22-35n-3w, drilling 1,600 ft., Sunburst 1,570-85 ft.
Huso Brothers 2 Ellingson, C SE SE 14-35n-3w, drilled into water at 1,806 ft., will P.B. to 1,780 ft. and test.
J. H. Agen 16 Goeddertz, CNL SE NW 23-35n-3w, water at 1,762 ft., P.B. to 1,747 ft., 40 and 100-qt. shots, shot again 140 qt., testing.
Nepstad Oil 2 Hugi, NE SE NW 11-35n-3w, spudded, first report.

Kansas Fields

(Continued from Page 103)

Douglas County: Meinholdt & Edwards 1 Stanley, NW NE NW 3-14-21e, Arbuckle 1,716 ft., 5-in. 1,906 ft., drilling 2,120 ft., with 2,100 ft. water in hole.
Epperson 1 Howard, SE NW 25-13-19e, Hertha 457 ft., drilling 800 ft.
Jefferson County: Caufield & Sullivan 1 Ragan, SW SW SE 29-10-20e, T.D. 1,710 ft. in Mississippi lime, bailed 1 gal. black oil per hr., P.B. 1,600 ft., S.D.
Leavenworth County: Archie 1 Schroeder, SE SW 28-9-20e, show oil 300 ft.
Nemaha County: Bumpus 1 Achten, S½ SE NW 12-4-14e, Mississippi 2,553 ft., show oil 2,560 ft.

NEBRASKA COMPLETIONS

Miller 1 Bethoud ..... E½ NW SW 2-4n-6e
T.D. 825 ft., temporarily abandoned.
Parker 1 Sunflower ..... E½ NE NE 3-7n-9e
Dry, T.D. 2,126 ft. in granite, St. Peter 2,032 ft., pre-Cambrian 2,102 ft., Otoe County.
John Findeiss 1 Ritter ..... NE NE 26-7n-12e
Temporarily abandoned.

NEBRASKA DRILLING REPORT

Gage County: Walt Rider 1 Warren, NE NE 21-3-5e, St. Peter 2,753 ft., pre-Cambrian 2,820 ft., 5-in. 2,770 ft., T.D. 2,858 ft., P.B. 2,630 ft., 5-in. 2,598 ft.
Furnas County: Morrison & Nosh 1 Alter, SE SW 28-1-22w, Fort Hays 480 ft., Greenhorn 800 ft., Dakota 910 ft., Permian 1,590 ft., anhydrite 1,880 ft., drilling 3,360 ft.
Trickett 1 Gossic, NW NW NW 33-2-21w, moving in 12-in. casing.
Gage County: Nelson 1 Ideus, W½ E½ SW 5-3-7e, drilling 50 ft.
Johnson County: W. H. Skelton 1 Rulla, SW SW 24-5-9e, rig.
Bodie & Hays 1 Eppley, NW NW NW 17-4-12e, rig.
Nemaha County: Bow & Arrow 1 Wrightsman, W½ SW NW 36-6-14e, some show oil 1,560 ft., drilling 1,675 ft.
Richardson County: Palensky 2 Kalous, SW SW SW 5-2n-13e, cored gray dolomite 1,564-77 ft., cored 1,577-89 ft. and 1,589-98 ft., no show, T.D. 1,598 ft.
Uhri 1-A Ogle, NW SE SE 9-1-14e, old well, Hunton 2,258 ft., T.D. 2,264 ft., P.B. 2,252 ft., butane and acid, pumped 300 bbl. fluid per day, 25 per cent oil.
Eckert-Powers 1 Albin, SW NW SW 10-1-14e, drilling 600 ft.

MISSOURI DRILLING REPORT

Boone County: Johnson 1 Early, NW NW SE 1-61n-12w, machine.
Ray County: Campbell 1 Rust, N½ NW SW 21-53n-26w, Mississippi lime 580 ft., drilling 900 ft.

Illinois Fields

(Continued from Page 116)

1,882 ft., Barlow 1,976 ft., Cypress sand 2,002-14 ft., Renault 2,201 ft., Ste. Genevieve 2,242 ft., McClosky 2,327-35 ft., T.D. 2,338 ft., running electric log.
Kennedy et al 1 Carson, S½ SW SE NE 16-1s-12w, T.D. 2,401 ft., P.B. 2,212 ft., Benoist 2,081 ft., drilled plug, tested water, squeezed, waiting on cement.
Wayne County: Texas 1 F. M. Draper, N½ NW SW 8-3s-6e, moving in rotary tools.
Texas 1 Joe Lewis, S½ NE SW 5-3s-6e, rig.
Wiser 1 Hilliard, S½ SE SW 27-1n-6e, first report, 10-in. 150 ft., waiting on cement.
New Penn. Dev. 1 M. Bothwell, SW NW SE 18-2s-9e, first report, 10-in. 148 ft., drilling 500 ft.
Pure 1 Liston-A, W½ NE NE 22-1s-8e, location, first report.
White County: Joe Dawson 1 Rodenberg, NE SE NE 11-6s-10e, first report, 10-in. 120 ft., waiting on cement.
Ryan Oil et al 1 Lamont, NE SW SW 33-3s-10e, Benoist 2,985 ft., Paint Creek 2,979 ft., Cypress 2,892 ft., 30-min. D.S. test 2,986-3,007 ft., recovered 50 ft. mud, T.D. 3,211 ft., P.B. 2,980 ft.
H. K. Riddle 1 Farmer's Nat. Bank of Grayville, W½ SW NW 30-3s-14w, first report, 10-in. 90 ft., drilling 1,390 ft.
Arrow Drlg. 1 Lamas, SW NW SW 14-4s-14w, first report, 10-in. 206 ft., drilling 510 ft.
Ryan Oil 1 L. Stoker, NW NW SE 28-4s-10e, rig, first report.
Shaffer-Stole 1 Aud, SE NE SE 27-6s-9e, set 10-in. 90 ft., waiting on cement.
Pure and Carter 1 Kisner, SE SE SE 7-6s-9e, set 8⅝-in. 231 ft., drilling 836 ft.
First Nat. Pet. Trust 1 Johnson, NE SE NW 5-5s-14w, Menard 2,079 ft., drilling 2,207 ft.
Roche-Boyles et al 1 C. Groff, E½ SE SW 25-3s-10e, Aux Vases 3,022-70 ft., 45-min. D.S. test 3,032-44 ft., recovered 95 ft. oil-cut mud, Ste. Genevieve 3,075 ft., coring 3,122 ft.
J. F. Morse 1 Sheldon, NW SW NW SE 11-19n-7e, S.D. 1,500 ft.

SOUTHWEST TEXAS

New Downstructure Pay Sand East of Agua Dulce Field

By F. L. SINGLETON

CORPUS CHRISTI, Tex., June 23.—Operators interested in the Agua Dulce field, Nueces County, were watching the outcome of a scheduled production test at S. E. W. Oil Corp. 1-B Pfluger, about 1 mile east of production which has shown evidence of production from a new sand lens. Casing was cemented below 7,250 ft. following an 8-minute drill-stem test in 20 ft. of a broken sand and shale bottomed at 7,200 ft. which recovered 1,200 ft. of oil and working pressure built up to 172 lb. On a previous test at 7,000 ft. 60 ft. of distillate was recovered and working pressure built up to 380 lb.

The well is located in Section 186 of the Paso Ancho de Abajo grant, several hundred feet east of the company's 1 Pfluger, completed earlier in the year for gas-distillate production at 6,900 ft., and northeast of development on the south and southeast flanks where important production has been developed at intervals from 6,500-7,000 ft.

SUMMARY OF COMPLETIONS

Lower Gulf Coast District

	No.	Bbl.	Footage
Oil wells: Agua Dulce	3	762	19,493
Stratton	3	284	19,950
Other fields	3	663	20,263
Gas wells: Fields	1	.....	3,035
Dry holes: Fields	1	.....	10,496
Wildcats	2	.....	13,019
Total	13	.....	86,256

Laredo District

	No.	Bbl.	Footage
Oil wells: Fields	13	1,172	36,939
Dry holes: Fields	4	.....	12,303
Wildcats	3	.....	9,784
Total	20	.....	59,126

San Antonio District

	No.	Bbl.	Footage
Oil wells: Fields	2	449	2,634
Gas wells: Fields	1	.....	1,202
Total	3	.....	3,836

The development of oil production from downstructure sands along the east flank of the Agua Dulce-Stratton structures which had up until the past year produced only gas-distillate will no doubt be considered as one of the most important phases of operations during the year. While development of oil production at Agua Dulce has not been as consistent as at Stratton, development of the east flank is still in the early stages, and it is probable that other productive areas will be found to exist around the flanks of this huge gas-cap.

That the new area recently opened on the extreme south flank will be limited to a small area was indicated as production on two wells offsetting the discovery producer proved disappointing. R. H. Hawn 1-C Bush Wofford is shut down at 7,100 ft. following a drill-stem test at 7,043-65 ft. which recovered mud and no pressure, while 1-B Wofford tested salt water on a drill-stem test through perforated casing at 7,038-44 ft. Another test was being attempted at 6,724-34 ft.

New Production Is Found on West Side of Chapman Field

A new sand discovery or an entirely new producing area flanking the west side of the Chapman Ranch field, Nueces County, was apparently assured as Seaboard Oil Co. 9 Chapman, 9,000 ft. west of production, recovered 970 ft. of 27-gravity oil on a drill-stem test at 4,269-74 ft. A second test at 4,274-79 ft. recovered 90 ft. of oil and 420 ft. of mud and the well is being drilled deeper to a contract depth of 6,500 ft. The discovery well of this field was drilled in 1937 by the Seaboard Oil Co., and production was opened from the Frio sand at 6,460-67 ft. The second well drilled, 3 Chapman, ¼ mile east of the discovery well, was completed in a new sand at 5,046-58 ft. Several attempts were made to extend production, but all were failures, and development in the area was halted in 1938. The showing in the present well is believed to be from the Catahoula section and in view of the fact that none of the wells drilled in the field proper logged this sand, the completion of 9 Chapman as a producer will no doubt be looked upon as a new field.

Midway Extended Mile West in 6,000-Ft. Sand

A mile west extension to the newly opened 6,000-ft. sand in the Midway field, San Patricio County, was assured as F. M. Boykin 1 Schrivner was flowing oil and wash water while testing through perforated casing at 6,070-80 ft. A sand and shale section cored at intervals from 6,400-6,500 ft. which carried a slight showing of oil and gas was tested before the hole was plugged back, but only salt water with a slight showing of oil was recovered.

The well is located west of British American 3 Ivey on the north side of the field, completed 2 weeks ago in the same sand, and it is possible that the sand will blanket the entire structure. Main production heretofore has been from the Frio sand at 5,300 ft., and this sand is not fully developed. Offsetting the extension producer, about 967 ft. northwest, British American Oil Co. is preparing to spud 1 D. C. Reed located in Section J of the George Paul subdivision of the Coleman Fulton Pasture land.

In the same county, and located 1 mile southwest of the Odem field, Wellington Oil Co. 1-C J. F. Welder was reported to be flowing oil and wash water while testing through perforated casing at 5,430-36 ft. This well has been in the process of completion for the past several weeks, and had showed for a gas-distillate producer at 6,715-20 ft.

Wilcox Trend Test Gets Several Oil Shows

Operators interested in the Wilcox trend centered their attention on Live Oak County where Edwin M. Jones cemented 5½-in. casing on bottom at 9,733 ft. in 3 West estate, 4½ miles southwest of the town of George West. This is one of the most interesting tests drilled along this particular sector of the Wilcox trend, and the prospects of production being developed are considered encouraging in view of the numerous showings of oil and gas which have been reported logged at intervals below 9,000 ft.

Northwest of the above well, and located near the town of Kitty, Continental 1 George West was coring in shale below 7,195 ft. with no further showings reported. The Carrizo, the upper member of the Wilcox was topped at 6,484 ft.

Another Wilcox test which is being watched with interest is Hewitt & Dougherty 1 L. E. Weiss, 4 miles west of Tuleta in the J. M. Oranga grant, Bee County. The well is bottomed at 9,503 ft. and is reported to be showing considerable pressure. A permeability test of sand at 9,429-45 ft., is reported to have shown evidence of distillate.

SOUTHWEST TEXAS COMPLETIONS

LOWER GULF COAST WILDCATS

Calhoun County: Continental 3 W. L. Moody, dry, T.D. 6,504 ft.

Nueces County: J. Calvert 1 Coopwood, dry, T.D. 6,515 ft.

FIELDS

Agua Dulce, Nueces County: C. P. Burton 3 Purl, 329 bbl., ¼-in. choke, perf. casing 6,428-42 ft., T.D. 6,460 ft.

H. H. Howell 7 Schulze, 130 bbl., ¼-in. choke, perf. casing 6,525-37 ft., T.D. 6,580 ft.

Shield 2 Harvey, 303 bbl., ¼-in. choke, perf. casing 6,424-35 ft., T.D. 6,453 ft.

Cologne, Victoria County: Harry 1 Edwards, gas well, sand 2,915-30 ft.

La Gloria, Brooks County: La Gloria Operators 1 La Gloria Unit 12, 165 bbl., open flow, perf. casing 6,650-90 ft., T.D. 6,850 ft.

La Gloria, Jim Wells County: La Gloria Operators 1 La Gloria Unit 11, 365 bbl., open flow, perf. casing 5,780-5,881 ft., T.D. 6,800 ft.

McCampbell, Aransas County: Bay-Tex 2 McCulloch, dry, T.D. 10,496 ft.

Shield, Nueces County: Shield 2-B Lewis, 133 bbl., ⅛-in. choke, perf. casing 6,608-13 ft., T.D. 6,613 ft.

Stratton, Nueces County: Southern Minerals 17 Stratton, 92 bbl., 7/64-in. choke, perf. casing 6,438-46 ft., 6,526-34 ft., T.D. 6,650 ft.

Southern Minerals 18 Stratton, 97 bbl., 7/64-in. choke, perf. casing 6,407-23 ft., T.D. 6,620 ft.

Southern Minerals 19 Stratton, 95 bbl., 7/64-in. choke, perf. casing 6,638-58 ft., T.D. 6,680 ft.

SOUTH TEXAS WILDCATS

Duval County: Magnolia 1 Duval County Ranch Co., *(Continued on Page 126)*

Oklahoma Fields

(Continued from Page 96)

ft., Checkerboard 4,781 ft., Big lime 4,924 ft., drilling 5,155 ft.

Hughes County: Breen 1-A Cahill, E½ NE SW 2-6-8, drilling 85 ft.

Bailey 1 N. Williams, SW SW NE 14-9-10, cementing cellar, T.D. 100 ft.

AVERAGE DAILY PRODUCTION

LEADING OKLAHOMA FIELDS

	June 21	June 14
Allen	4,500	4,600
Billings	6,200	6,225
Burbank	8,050	7,925
South Burbank	7,325	7,425
Balance Osage	17,975	18,300
Blackwell district	3,550	3,600
Bristow-Slick	6,450	6,475
Chandler	925	900
Crescent	1,650	1,675
East Cromwell	2,100	2,350
Cromwell	2,825	2,800
Cumberland	6,700	6,700
Cushing-Shamrock	9,050	8,950
Dill	4,750	5,250
Duncan	3,525	3,550
Edmond	3,500	3,450
Fish	4,150	3,875
Fitts	12,350	12,650
Jesse	1,900	1,975
Graham-Fox	2,300	2,275
Healdton	8,700	8,500
Hewitt	10,750	10,500
Keokuk	2,725	2,750
Konawa	1,050	1,000
Lucien	5,825	5,750
Moore	950	925
Northeastern counties	17,250	17,250
Oklahoma City	82,250	81,650
Olympic	1,650	1,700
Ramsey	3,875	3,850
Sasakwa	1,200	1,275
Sholem-Alechem	2,575	2,550
Seminole district:		
Bowlegs	6,050	6,150
Carr City	2,225	2,225
Dora	1,175	1,150
Earlsboro	3,925	3,850
East Earlsboro	1,700	1,625
South Earlsboro	550	525
Little River	6,275	6,150
East Little River	750	600
Mission	1,250	1,250
Seminole	6,350	6,225
East Seminole	950	950
Searight	1,725	1,700
Total Seminole	32,925	32,400
St. Louis-Pearson	18,200	21,650
Tatums-Tussy	5,325	5,400
Tonkawa-Garber-Thomas	3,600	3,650
Wewoka	1,850	2,000
Yale-Jennings	3,300	3,275
Total Oklahoma	414,125	415,550

Kay County: Marr & Vaughn 1 Constant, N½ NE SE 6-27-1w, Oread 2,080 ft., Tonkawa sand 2,400 ft., Layton 2,854 ft., cored medium tight sand, good odor gas in top, 2,860-78 ft., Hogshooter 2,950 ft., Mississippi lime 3,460 ft., cored Wilcox sand with spots green shale near bottom 3,515-22 ft., D.S. test with packer 3,515 ft., recovered 200 ft. salt water, Wilcox 3,503 ft., Arbuckle 3,636 ft., cored lime and shale 3,675-76½ ft., drilling ahead, may P.B. to test show in Oswego 3,310-40 ft.

Le Flore County: Western Oklahoma 1 Ward, NW SW NW 27-9-24, base Wapanucka 5,558 ft., cored shale with sand spots 5,650-67 ft., drilling 5,747 ft.

Lincoln County: Vanderpool 1 Menshall, SE SE SW 11-16-3, drilling 500 ft.

Allied Materials 1 Hicks, NW NW NW 25-13-6, first report.

Dunnett 1 Brown, NW NW SW 17-15-4, first report.

Dunnett 1 Luckenbill, SW SE SE 29-15-5, first report.

Kemp 1 McLaurey, SE SE SW 28-17-5, drilling 2,260 ft.

Logan County: Continental 1 Lenigar, SW SE SW 17-15-3w, Wilcox 6,219 ft., cored stained dolomitic sand 6,240-44 ft., cored well saturated sand 6,244-56 ft., Marshall zone 6,252 ft., cored sandy dolomite 6,379-94 ft., second Wilcox 6,392 ft., cored salty sand, bleeding in spots 6,394-6,401 ft., P.B. 6,265 ft., 7-in. 6,029 ft., to test first Wilcox.

Olson 1 Paulk, N½ NE SE 33-18-3w, first report.

Muskogee County: Pine 1 Lacey & Steele, SE NE NW 24-13-17, drilling 1,725 ft.

Noble County: Samedan 1 Briggs, SE SE SW 29-21-1w, second Wilcox 5,065-75 ft., T.D., P.B. 3,560 ft., perf. and had good show gas, S.D.

Superior 1 Faubian, SE SW SE 16-22-1, first Wilcox 4,732 ft., D.S. test 4,743 ft., filled up 3,060 ft. fluid in hole, estimated 50 per cent oil, electrical log showed 6 ft. saturated Wilcox sand on top and rest showed water, cored 4,743-47½ ft., recovered spotted stained Wilcox, cored sandy shale 4,761-

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69 ft., second Wilcox 4,880-94 ft., T.D., 7-in. 4,922 ft., perf. 4,728-30½ ft., filled 800 ft., swabbed 2 bbl. oil and water in 30 min., 25 per cent oil, pulled tubing to perf. up the hole.

Okfuskee County: Walker & Sexton 1 Hilderbrandt, NW NE NE 19-10-11, drilling 593 ft.

Shelton 1 Armstrong, SE SE NW 3-11-10, old well shut in Nov. 12, 1940, cleaning out to T. D. 3,394 ft., filled up 3,375 ft. of fluid, swabbed and flowed 25 bbl. in 6½ hr., swabbed and flowed 45 bbl. in 24 hr. through 2½-in. tubing with packer set at 3,019 ft., cleaning out tubing.

Alma 1 Replogle, NW SW NW 14-11-10, lower Cromwell 3,171-89 ft., deepened to 3,215 ft., flowed 40 bbl. oil and 356 bbl. water in 24 hr. through casing, testing.

Mico 1 Curry, NW SE NW 17-12-8, drilling 2,051 ft.

Texas 1 McKernan, N½ NW SW 15-12-9, Wapanucka-Cromwell zone 3,283 ft., T.D. 3,304 ft., flowed 112 bbl. in 24 hr. through casing, 7,000,000 cu. ft. gas.

Osage County: Keener 1-A Osage, SW SW NW 10-22-9, drilling 950 ft.

Black Jack 1 Osage, NE NE SW 29-25-7, recovered fish at 1,225 ft., and drilling ahead.

Devonian 1-A Osage, SW SW NE 34-22-7, first report.

Pawnee County: Sand Springs 1 Launer, SW SW SW 25-20-6, Pink lime 2,840-45 ft., Redfork 2,892-2,908 ft., some show oil and gas, drilling 2,908 ft.

Payne County: Anderson & Prichard 1 McGuire, SE SE NW 20-18-1, Viola 5,139 ft., Dense 5,180 ft., dolomite 5,190 ft., cored sandy dolomite with spotted stain, sand and shale 5,214-25 ft., cored stained sand with odor 5,225-26 ft., cored sand with spotted stain and shale streaks 5,226-34 ft., 7-in. 5,178 ft.

Pontotoc County: Cason 1 Adcock, SE NW NE 21-4-6, first report.

Pottawatomie County: Sharpe 1 Billington, NW SE SE 21-9-4, Sylvan 4,400 ft., Viola 4,490 ft., dense 4,550 ft., dolomite 4,585 ft., Wilcox 4,636 ft., cored dense lime 4,545-52 ft., cored slightly stained dolomite and saturated sand 4,638-48 ft., electrical log showed good porosity 4,632-40 ft., T.D. 4,640 ft., 5½-in. 4,634 ft., squeezed 75 sacks, drilled plug.

Manahan 1 Brown, SE SE SE 21-10-3, drilling 2,350 ft.

Lippert 1 Rosebush, NE SE SW 34-10-3, drilling 3,410 ft.

Meyers 1 Johnson, NE SE NE 34-10-3, started up June 17.

Seminole County: Heimerich & Payne 1 School land, NW NW NE 16-7-5, Calvin 2,795 ft., dense 4,050 ft., T.D. 4,062 ft., run casing.

Hall Jordan 1 Jennings, SE SE 8-8-8, cellar and pits.

Paul McIntyre, 1 Honning, SW SW SE 2-9-7, spud.

Winona 1 Heller, NE NE NE 25-10-7, Brown lime 3,187 ft., Booch 3,305-19 ft., Gilcrease 3,432-44 ft., sand 3,458-82 ft., Wapanucka 3,487 ft., stained lime 3,551-56 ft., 7-in. 3,553 ft., Cromwell sand 3,556-57 ft.

Mico 1 Kidd, NE SW SE 33-10-8, Cromwell 3,716 ft., T.D. 3,746 ft., 5½-in. 3,400 ft., top plug 3,422 ft., shot 3,385-3,429 ft., no show, shut in 3 days, hole full fluid.

Shell 1 Keyes-B, SW SW NE 22-11-8, Hunton 4,084 ft., show oil 4,128-50 ft., Sylvan 4,174 ft., Viola 4,264 ft., dense 4,294 ft., first Wilcox 4,310-14 ft., no show, second Wilcox 4,335 ft., cored stained sand 4,336-47 ft., looked like dead oil, electrical log.

Wagoner County: Minter 1 McGinniss, NE SE NE 30-18-17, Dutcher 430-40 ft., Mississippi 590 ft., T.D. 850 ft., under high water.

Southwestern

Atoka County: Matson 2 Rowland, SW NE NE 18-3s-10e, broken sand 487-521 ft., T.D., run 5-in. casing, S.D.

Caddo County: Ray Stephens 1-A Johnston, NW NE NW 18-5-8w, cellar.

Olson 1 Ka-Way-Kla, SE NE NW 28-6-11w, drilling 2,285 ft.

Thornton-Westcock 1 Cooke, NE SE NE 35-5-9w, T.D. 407 ft., rotary.

Texas 2 Smith, SE NW 2-5-12w, D.S. test 3,388 ft., flowed 125 bbl. in 55 min. from Simpson bromide, blew out between 7-in. and 13⅜-in. casing from Hunton, est. 25,000,000 cu. ft. gas, killed well and cementing off, building new derrick.

Choctaw County: Carter 1 Shull, SE SW NE 20-6s-18e, drilling 590 ft.

Sinclair Prairie 1 Craig, NE NE SE 30-8-1w, Oread 4,310-45 ft., Chert 4,460-70 ft., Belle City 4,978-5,010 ft., drilling in shale 5,260 ft.

Comanche County: Cooper 1 Bowen, SE NW SE 29-2-9w, T.D. 1,615 ft., granite wash, 7-in. 1,615 ft., moving in machine.

Garvin County: Ohio 1 Feaster, NW NW SE 13-3-1, top Simpson 3,220 ft., cored sand and shale 2,963-76 ft.

Jackson County: Fain Porter 1 Wilson, SE SW 30-2-22w, top Strawn 5,058 ft., drilling 6,351 ft.

Kiowa County: Kelly Wells 1-A Oster, SW NE NW 33-7-17w, first report.

Mathews-Lewis 1 Brazell, NE NE NE NE 33-7-17w, first report.

Love County: Colvin & Hicks 2 Westheimer & Daube, W½ SE SW 27-6s-2e, sand line 3,011-18 ft., acid, swabbed and flowed 3 to 5 bbl. daily, T.D. 3,022 ft., may plug and abandon.

Magnolia 1 Watson, SW SE NW 12-7s-2e, water sand 1,965-75 ft., drilling 1,995 ft.

Joe Baldwin 1 Hill, NW NW SE 26-8s-2e, building derrick for 6,000-ft. test.

Johnston County: Baldwin & Reed 1 Davis, S½ SW NW 8-2s-8e, drilling shale 690 ft.

Kiowa County: Thomasson 1 Baker, NW NE NW 7-6-18w, drilling 85 ft.

Love County: Batson 1 Walden, NE NW NW 34-6s-2e, Sylvan 2,145 ft., Viola 2,180 ft., lime show oil 2,225-32 ft., drilling 2,245 ft.

Stephens County: Heimerich & Payne 1 Cryer, SE NE SW 33-2-5w, T.D. 6,181 ft., drill pipe stuck at 3,900 ft.

Skelly 4 Robberson, NE NE 35-1s-5w, cemented perf. 5,240-46 ft., T.D. 7,808 ft., P.B. 7,580 ft., perf. 7,200-15 ft., 7,140-90 ft., and 7,120-35 ft. for bromide sand zone, set 2-in. tubing with packer at 7,093 ft., after cleaning mud and water for 20 min., flowed 286 bbl. oil with mud in 15 hr., packer leaking mud, est. 500,000 cu. ft. gas, 575 lb. pressure on tubing, pulled tubing, flowed 311 bbl. in 24 hr.

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CANADIAN FIELDS

Canadian Geological Survey Plans Study of Plains Area

By VICTOR LAURISTON

CHATHAM, Ont., June 21.—Average daily crude production from all Alberta fields for the week ending June 9 totaled 27,700 bbl., compared with 26,980 bbl. for the previous week, and 20,837 for the corresponding week last year. The production included 26,745 bbl. of crude and 720 bbl. of natural gasoline from Turner Valley and 82 bbl. from outside fields.

Turner Valley Lime Tests

North Turner Valley: Miracle Royalties 1, LSD 3, 4-21-3w5, fishing, Madison 7,524 ft.

Major Oil Investments 1, LSD 5, 34-20-3w5, T.D. 7,593 ft., P.B. 6,665 ft., 414 bbl. from upper zone, acid.

Home Oil 7, LSD 14, 33-20-3w5, below 8,329 ft., Madison 8,088 ft.

Royalite Oil 47, LSD 15, 15-20-3w5, below 8,491 ft. after lime 8,365 ft.

Royalite 56, LSD 12, 14-20-3w5, lime 7,425 ft., deepening after cementing casing at 7,429 ft.

North Central section: Harris Royalties 3, LSD 16, 3-20-3w5, T.D. 8,927 ft. after drilling only the upper porous, cleaning out.

Empress Royalties 1, LSD 5, 2-20-3w5, standing cemented in top Madison at 8,684 ft.

West Central section: British American-Brown 2, LSD 2, 24-19-3w5, T.D. 8,357 ft., more than 470 ft. in the lime.

Atlas Royalties 1, LSD 1, T.D. 8,070 ft., acidizing and testing, 267 bbl. natural.

Twin Valley Syndicate 2, LSD 10, 13-19-3w5, T.D. 8,470 ft., is acidizing and testing.

Sunray Petroleum Corp. 1, LSD 8, T.D. 8,267 ft., flowed at the rate of 350 bbl. after light acid treatment, looks like good producer.

Anglo-Canadian 9, LSD 14, 7-19-2w5, T.D. 7,589 ft., 459 ft. in the Madison, acidizing and testing.

Royalite 55, LSD 7, T.D. 7,643 ft., 661 bbl. on official test.

New Tests Starting

North Turner Valley: Major Oil Investments 1, LSD 14, 35-21-4w5, most northerly test in the field, waiting for rotary.

Royalite Oil 60, LSD 5, 14-20-3w5, location.

Outside Fields

Clearwater: Clear Oils 1, LSD 8, 2-35-10w5, in Devonian limestone below 2,777 ft. with no increase in porosity.

Blood Indian Reserve: Northwest-Treaty 1, LSD 4, 17-8-23w4, below 2,971 ft.

Lethbridge: Lethbridge Petroleums 1, LSD 12, 11-8-22w4, is below 4,010 ft., some oil shows in the Ellis, Madison limestone expected around 4,120 ft.

Vermilion: Conestoga 1, LSD 2, 30-50-5w4, T.D. 1,850 ft., around 150 bbl.

Richardson 1, LSD 14, 20-50-5w4, T.D. 1,825 ft., 133 bbl.

Kinsella: Northwestern Utilities 1, gas test, T.D. below 2,194 ft.

Wainwright: Bethwain 2, finished some years ago, has been reconditioned and put on the pump, making 117 bbl. in May.

Steveville: Standard of British Columbia 3 Princess, LSD 5, 13-20-12w4, finished in the Madison lime below 3,260 ft., recemented for water shut off and gun perforated in the lime. Flowed 78 bbl. in 8 hr., or at the rate of 234 bbl. daily. The crude appears to be water free. Production tests are continuing.

Standard 4 Princess, LSD 13, 12-20-12w4, bottoming at 3,300 ft., completed as a gasser.

Standard 2 Princess, LSD 3, 13-20-12w4, has recemented and is testing.

Standard 1 C. P. R.-Rainey Hills, LSD 1, 23-18-11w4, is deepening after cementing casing at 434 ft.

Anaconda-Patricia 1, LSD 9, 31-20-12w4, resuming after cementing 10-in. casing at 471 ft.

Geological Surveys

Details have been made public of work planned for the coming season by the Geological Survey of Canada, much of it being concerned with potential oil and gas areas. B. R. MacKay will cover the Wawa area and do supplementary work in the foothills between Coalspur and Brazeau. H. H. Beach will work on the Marble Mountain area north of Red Deer, and the Limestone Mountain area farther west. J. S. Stewart will map the Bassano area in the central plains, and continue work farther east in the Steveville field. C. O. Hage will do preliminary mapping in the Dyson Creek area, and J. A. Macdonald

(Continued on Page 127)

Thrust Faulting in Ordovician Of Abell Proved in Outpost

By R. MARNE SANFORD

MIDLAND, Tex., June 23.—A northeast outpost to the Abell field of northern Pecos County has set casing for a test of saturation in the Ellenburger lime found after drilling through a fault plane in the Simpson and Ellenburger sections. The well is Magnolia 1 J. F. McKee, Section 25, Block 9, H.&G.N. Survey, an east offset to the Abell 1 Rixse, a small producer a mile north of the discovery well. The 1 McKee topped the Simpson first at a slightly higher point, structurally, than other wells in the field, and entered the Ellenburger immediately below at 5,808 ft. Drilling about a 45-ft. section of Ellenburger lime, the well again entered the Simpson at about 5,855 ft. and penetrated this zone to 5,914 ft., where the Ellenburger was again topped. A core from 5,920 to 5,940 ft. recovered 4½ ft. of fractured dolomite showing oil. A 30-minute drill-stem test of the section recovered 210 ft. of fluid of which about half was oil. At last reports the 5½-in. casing was being cemented for testing.

Some faulting and folding had been believed present in the field ever since its discovery, since the regular pay level in the Simpson section was found with a variation of some 200 ft. in different wells in the field. No test to date had actually cut a fault plane. The region in which the Abell field is located is about 50 miles north and slightly west of the Glass Mountains of western Pecos County in which both normal and thrust faulting are known to occur.

Faulting and folding were both indicated in the Apco field just south of Abell when a well was thought to have cut a fault plane and when a 2-mile-south outpost found production from the same section but at an entirely different level, structurally. Development in the Abell field will be extremely hazardous hereafter since even a one-location outpost may fail entirely to find the prospective pay zone or may find double sections of some lower formations. Now that faulting is definitely known to be present, a great deal of helpful information should result from subsequent wells drilled in the field.

SUMMARY OF COMPLETIONS

Southern West Texas

	No.	Bbl.	Footage
Oil wells: North Cowden	3	1,173	13,495
McElroy	2	942	5,979
Johnson	3	2,399	12,760
Foster	4	2,453	16,983
Taylor-Link	2	765	3,401
McCamey	2	445	5,062
Ward	2	688	6,071
Keystone	2	604	6,247
Other fields	7	6,215	20,934
Dry holes: Fields	3	.....	6,536
Total	30	.....	97,468

Northern West Texas

	No.	Bbl.	Footage
Oil wells: Slaughter	8	6,418	40,075
Wasson	6	6,268	30,652
Seminole	1	849	5,220
Total	15	.....	75,947

Southeast New Mexico

	No.	Bbl.	Footage
Oil wells	2	600	3,856
Dry holes	1	.....	2,386
Total	3	.....	6,242

Texas Panhandle

	No.	Bbl.	Footage
Oil wells: Carson	2	168	6,242
Gray	7	1,642	22,121
Hutchinson	5	1,052	15,339
Total	14	.....	43,702

Oil Shows Found in Clearfork Zone East of Kermit

Magnolia 20 State-Walton, wildcat 1¾ miles east of production in the Kermit field of Winkler County, found broken shows of oil in the Clearfork section during the week to indicate the presence of a deeper producing reservoir for the area. The zone showing oil was the Tubb pay of lower Clearfork series, producing at Sand Hills in Crane County and in the northern part of the North Cowden field of Ector County some 40 miles to the northeast. Shows of oil were found from 4,854-71 ft., 4,934-49 ft., and from 5,080-96 ft. It was last reported drilling below 5,141 ft. The wildcat is located in NW cor. Section 4, Block 23-B, P.S.L. Survey.

Deep Wildcats To Start

CRANE COUNTY.—Late in the week Continental Oil Co. announced intentions to drill an Ordovician wildcat in the southwestern part of Crane County and about 1½ miles south of the recent 4-mile-south extension to the Sand Hills Ordovician field opened by Gulf Oil Corp. Destined to be one of the most closely watched deep tests yet drilled in West Texas, it will reveal much regarding the validity of the theory that a structurally high ridge exists through northern Pecos County and north into Crane County. The new Ordovician project is just south of the Gulf extension well and just across the river north from the Abell field of Pecos County. It is to be 1 Jones, 660 ft. from the NE and NW lines of Section 12, Block 3, H.&T.C. Survey.

WARD COUNTY.—Shell Oil Co., Inc., has definitely announced intentions to drill an 11,000-ft. wildcat test 2½ miles northeast of Monahans in northeastern Ward County. It is 1 Sealy-Smith Foundation, 2,310 ft. from the south and 330 ft. from the east lines of Section 38, Block A, G.&M.M.B.&A. Survey. It is near the center of a solid block of 19,725 acres held by Shell. It is believed that the test will be drilled with company tools. However, a drilling contract may be let.

SOUTHERN WEST TEXAS COMPLETIONS

(24-hr. ratings based on last 3 hr. of 6-hr. gage)

Abell, Pecos County, Phillips 2 Silverman, 1,104 bbl., ½-in. choke, 5,367-87 ft., T.D. 5,400 ft.
Phillips 1-128 Price, dry at 2,983 ft.
Bean, Crockett County: Wahlenmaier & Currie 2-X Bean, dry at 1,558 ft.
Cowden, North, Andrews County: Atlantic & Sun 4-B Holt, 262 bbl., 525-qt. shot, 4,495-4,555 ft.
Cowden, North, Ector County: Magnolia 3 Cowden, 37 bbl. oil plus 1.3 per cent water, 7/32-in. choke, 3,000 gal. acid, 4,267-4,420 ft.
Texas Pacific 12 Holt, 874 bbl., 690-qt. shot, 4,360-4,520 ft.
Cowden, Winkler County: G. V. Lyman 2-A Cowden, 433 bbl., 2 per cent water, 1-in. choke, 400-qt. shot, 2,740-2,980 ft.
Estes, Ward County: Gulf 146 Estes, 1,812 bbl., 740-qt. shot, 2,455-2,687 ft.
Foster, Ector County: Cities Service 1-B Bagley, 260 bbl., ¾-in. choke, 244-qt. shot, 4,210-85 ft.
Forest Development Corp. 10-H Moss, 321 bbl., 405-qt. shot, 4,143-4,296 ft.
Trinity Drlg. 8 Henderson, 1,204 bbl., 425-qt. shot, 4,117-4,277 ft.
Fred Turner 2-B Addis, 668 bbl., 1-in. choke, 3,820-4,125 ft.
Halley, Winkler County: Skelly Oil 40 Halley, 1,100 bbl., 220-qt. shot, 2,775-2,890 ft.
Johnson, Ector County: Atlantic 2-H Johnson, 825 bbl., ½-in. choke, plus 4 per cent water, 275-qt. shot, 4,090-4,160 ft.
M. J. Delaney 3-B Johnson, 1,226 bbl., 4,020-4,150 ft.
Mid-Continent 3 Hinkle, 348 bbl., 550-qt. shot, 4,200-4,360 ft.
Keystone, Winkler County: S. W. Richardson 3 Jenkins-Southland, 279 bbl., 1-in. choke, 320-qt. shot, 3,242-3,372 ft., T.D. 3,387 ft.
Standard Oil of Texas 16-19 Baird, 325 bbl., 340-qt. shot, 3,215-3,315 ft., T.D. 3,357 ft.
McCamey, Upton County: Gulf 19 Sherk, 184 bbl. oil and 99 bbl. water, pumping, 3,000 gal. acid, 2,372-80 ft.
Texas Pacific 3-C Sherk, 261 bbl., pumping 2,677-82 ft.
McElroy, Crane County: Gulf 52 Crier-McElroy, 455 bbl., 810-qt. shot, 2,775-2,993 ft.
Gulf 53 Crier-McElroy, 487 bbl., 770-qt. shot, 2,786-2,986 ft.
Taylor-Link, Pecos County: Aha Oil 2-F University, 5 bbl., pumping, 3,000 gal. acid, 1,666-75 ft.
D. Breeding 6-J University, 760 bbl., 2,000 gal. acid, 1,615-1,726 ft.
R. Choate 1 Beauchamp, dry at 1,995 ft.
Tobarg, Pecos County: Cardinal Oil 6-K Tippett, 10 bbl., pumping, 30-qt. shot, 390-421 ft.
Tubb, Crane County: Humble 55 Tubb, 1,684 bbl., 3,000 gal. acid, 4,260-4,400 ft.
Ward, North, Ward County: Luse & Ice 1 Robeson, 229 bbl., 2,500 gal. acid, 2,907-3,041 ft.
Sinclair Prairie 27 Archenhoid, 459 bbl., 3,500 gal. acid, 2,963-3,030 ft.
White & Baker, Pecos County: Cooper & McDermott 1-A White & Baker, 72 bbl., ⅛-in. choke, 2,123-65 ft.

SOUTHERN WEST TEXAS ACTIVE WILDCATS

Brewster County: Chester Dewey 1 Decies, 660 ft. from N and 1,980 ft. from S lines, Sec. 45, Blk. 4, G.C.& S.F. Sur., 3,000-ft. test, moving in materials.
Crockett County: Bolsa Chico Oil 1 Bouscaren, 624 ft. from S and 330 ft. from E lines Sec. 57, Blk. GG, T.C.R.R. Sur., drilling 190 ft.
Bolsa Chico Oil 1 Noelke, 467 ft. from N and E lines, Sec. 22, Blk. GG, G.C.&S.F. Sur., moving in spudder.
R. H. Henderson 1 Couch, 467 ft. from N and 2,173 ft. from E lines Sec. 37, Blk. GG, H.E.&W.T. Sur., 8¾-in. 6,488 ft.
Crane County: Continental 1 E. B. Jones, 660 ft. from NE and NW lines Sec. 12, Blk. 3, H.&T.C. Sur., Ordovician test.
Loving County: Pinal Dome Oil 1 Michigan Oil fee, NW SW Sec. 15, Blk. 26-C, P.S.L. Sur., 5,300-ft. test, fishing 4,872 ft.
Pecos County: Redmond, Greene & Davis 1 Iowa Trust, E½ W¼ Sec. 29, Blk. 10, H.&G.N. Sur., Ordovician test, 7-in. casing at 3,006 ft.
Anderson-Prichard 1 Boren, 1,979 ft. from S and 660 ft. from E lines Sec. 4, L. Merchant Sur., set 13-in. casing at 77 ft.
Cremin & Boren 1 Bowen, 2,310 ft. from NW and 1,650 ft. from NE lines Sec. 60, Blk. 10, H.&G.N. Sur., 2,100-ft. test, drilling 30 ft.
Phillips 2 Nutt, 1,980 ft. from W and S lines Sec. 17, Blk. 125, T.&St.L. Sur., 2,500-ft. test, location.
A. Hargrove 1 Univ.-Continental, NE cor. Sec. 4, Blk. 7, University Sur., drilling 535 ft.
Reagan County: Amerada 1-RA University, Sec. 3, Blk. 48, University Lands Sur., drilling 7,268 ft.
Terrell County: Texas Consolidated 1 Holmes, NE NE Sec. 14, Blk. 2-A, G.H.&S.A. Sur., 3,600-ft. test, drilling 1,900 ft.
Upton County: Plymouth Oil 1 Alford, C Sec. 50, Blk. 12, P. B. Scott Sur., Ordovician test, drilling below 3,100 ft.
Mesquite Oil 1 Cross, Sec. 34, C.&M. Sur., T.D. 1,375 ft., last report.
Ward County: Stanolind 1 Spencer-Evans, 476 ft. from NW and 2,173 ft. from SW, Sec. 53, Blk. 34, H.& T.C. Sur., 3,500-ft. test, drilling 2,812 ft.
J. E. Fitzpatrick 1 Pruitt, 467 ft. out of S cor. Sec. 21, Blk. 1, W.¾N.W. Sur., drilling 1,145 ft.
Shell 1 Sealy-Smith, 2,310 ft. from S and 330 ft. from E lines Sec. 28, Blk. A, G.M.M.B.&A. Sur., Ordovician test, building road.
Winkler County: Magnolia 20 States-Walton, NW cor. Sec. 4, Blk. 3-B, P.S.L. Sur., drilling 5,141 ft.
Sam Weiner 2 Halley, NW NE Sec. 7, Blk. 11-B, P.S.L. Sur., fishing 3,023 ft.

Cochran and Terry County Wildcats Still Testing

Interest in the north Permian basin was centered on several wildcat tests which were at or nearing crucial stages. In Terry County the indicated discovery of the previous week is swabbing into pits and showing a little oil after being treated with acid. It is Texas 1 Murphy, 660 ft. from the north and west corner of Section 22, Block K, P.S.L. Survey, north of Wasson and south of Slaughter. Treated with 1,000 gal., it swabbed into the pits for 14 hours making an estimated 110 bbl. of fluid, mostly oil load and acid residue. Bottomed at 5,275 ft., the fluid level was reported to be at 750 ft.

Cochran County's prospective discovery 3½ miles north of Slaughter was testing after third-stage acid treatment. It is O'Neal Drilling Co. 1 Della Slaughter Wright, Labor 12, League 60, Martin County School Lands Survey. Treated with 1,500 gal., 3,500 gal. and lastly with 6,000 gal., the well was swabbing fluid at the rate of 10 bbl. hourly, about 80 per cent oil and 20 per cent water. It is bottomed at 4,983 ft. with pay from 4,950 to total depth. The difference in gravity of the oil and the fact that it has shown sweet gas is indicative of a new field rather than a major Slaughter field extension.

NORTHERN WEST TEXAS COMPLETIONS

(24-hr. ratings based on last 3 hr. of 6-hr. gage)

Seminole, Gaines County: Amerada 3 Austin, 849 bbl., ½-in. choke, 215-qt. shot, 5,076-5,220 ft.
Slaughter, Cochran County: Atlantic 13 Boyd, 1,149 bbl., 10,000 gal. acid, 4,935-5,065 ft.
Devonian Oil 5-B Duggan, 809 bbl., 10,500 gal. acid, 5,013-62 ft.
Honolulu Oil 5-3 Igoe & Smith, 985 bbl., 9,000 gal. acid, 4,925-86 ft.
Slaughter, Hockley County: Fain & Riner 3 Slaughter, 524 bbl., 2-in. casing outlet, 10,000 gal. acid, 4,872-4,982 ft.
Honolulu 5-B Mallett, 936 bbl., 2-in. casing outlet, 9,000 gal. acid, 4,955-5,008 ft.
Magnolia 1-B Graham, 325 bbl., 3-in. casing outlet, 10,500 gal. acid, 4,940-5,004 ft.
Magnolia 3-E Mallett, 976 bbl., 3-in. casing outlet, 10,500 gal. acid, 4,928-5,000 ft.
Milhoan Prod. 1 Fannin & Slaughter, 714 bbl., 2-in. casing outlet, 11,000 gal. acid, 4,834-4,968 ft.
Wasson, Gaines County: Amon G. Carter 10 Moore, 867 bbl., 11,000 gal. acid, 4,875-5,033 ft.
Carter & Continental 2-A Willard, 1,126 bbl., 1-in.

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choke, 9,000 gal. acid, 4,854-5,030 ft.
Continental Oil 8-46 Moore, 872 bbl., 1-in. choke, 12,000 gal. acid, 4,870-4,989 ft.
Wasson, Yoakum County: Aloco Oil 16-B Miller, 899 bbl., 10,000 gal. acid, 4,940-5,219 ft.
Aloco Oil 10 Walker, 184 bbl., 7/64-in. choke, 10,000 gal. acid, 5,051-5,261 ft.
Argo Oil 3-B Comer, 2,320 bbl., 8,500 gal. acid, 4,928-5,120 ft.

NORTHERN WEST TEXAS ACTIVE WILDCATS

Andrews County: Magnolia 1 Ralph, NE cor. Sec. 20, Blk. 39-A, P.S.L. Sur., drilling 4,854 ft.
Phillips 1 University-Drews, NW NE Sec. 32, Blk. 10, University Lands Sur., 8,368 ft.
Mascho Oil 1 University, Sec. 11, Blk. 13, University Sur., 6½ mi. NW of 1 Fisher, 8⅝-in. 1,798 ft., drilling at 3,975 ft.
Mascho Oil 1 Univ.-Gulf, NW cor. Sec. 19, Blk. 9, University Sur., drilling 4,416 ft.
T. P. Coal & Oil and Seaboard 1-C Midland Farms, 660 ft. from S and E lines Sec. 8, Blk. 41, G.M.M. B.&A. Sur., 5,000-ft. test.
Borden County: Coffield & Guthrie 1 Conrad, SE NW Sec. 79, Blk. 20, Lavaca Nav. Co., Sur., 3,250-ft. test, S.D. 353 ft.
Cochran County: O'Neal Drilling Co. 1 Wright, NE cor. Lab. 12, Lge. 60, Martin C.S.L. Sur., 3 mi N of Dean area, 5½-in. 4,940 ft., T.D. 4,983 ft., acidized 1,500 gal., second treatment 3,500 gal., third treatment 6,000 gal., swabbing at 4,983 ft.
Helmerich & Payne 1 Slaughter, 330 ft. from N and 290 from W lines Lab. 67, Lge. 136, Armstrong C.S.L. Sur., 5,500-ft. test, drilling 4,875 ft.
Gaines County: Amon G. Carter 4-D Wasson, NW SE Sec. 50, Blk. AX, P.S.L. Sur., drilling at 10,565 ft., last report.
Hale County: Humble 1 Byrd, SE SE NE Sec. 17, Blk. K, E.T.R.R. Sur., 9,000-ft. test, 9⅝-in. 4,396 ft., drilling 6,756 ft.
Martin County: Wiggins & Hyde 1 Stinson & Burley, NE SW Sec. 4, Blk. 38, T.&P. Sur., 5,000-ft. test, spudded 255 ft., set 13-in. casing.
Terry County: Texas 1 S. T. Murphy, NW NW NW Sec. 22, Blk. K, P.S.L. Sur., 5,500-ft. test, sat. 5,252-72 ft., 5½-in. 5,166 ft., S.D. 2,275 ft.
Anderson-Prichard and Osage 1 Frances Christman, 660 ft. from W and S lines Sec. 49, Blk. T, D.&W. Sur., 5,500-ft. test, cellar and pits.
Yoakum County: Dr. Sam Dunn 1 Moore, Sec. 486, drilling below 3,315 ft., last report.
Shell 1 M. L. Hammer, 330 ft. from W and S lines Sec. 490, Blk. D, J. H. Gibson Sur., 5,700-ft. test, drilling water well.

SOUTHEAST NEW MEXICO COMPLETIONS

Maljamar: Eddy County, Cockburn 9-A Pearsall, SE NW 33-17-32, 120 bbl. in 3 hr., T.D. 3,396 ft.
Red Lakes, Eddy County: Otis Roberts 1 State, SE SE 24-17-27, 10 bbl. in 13 hr., T.D. 460 ft.
Wildcat, Eddy County: Brewer 1 Hoffman, SE SW 14-17-24, dry at 2,386 ft.

Drilling Report

Chaves County: Elliott 1 State, NW NE 16-11-31, re running 7-in. 3,915 ft.
Montgomery 1 Purcell, SW NW 13-11-26, S.D. 2,202 ft.
Willson 1 Brown, NW SW 29-11-23, drilling 1,704 ft
Eddy County: H. Aid 1 Wentz, NE NW 34-17-30, drilling 2,975 ft.
Friess, Stampfli & Martin 1 Friess, NE SW 19-17-31, drilling 510 ft.
Flynn 1 Evans, SW SW 18-17-25, running 8⅛-in., 480 ft.
Hegwar 1 Root, NW NE 12-17-29, drilling 1,817 ft.
Hightower 1 Grier, NW NW 12-17-29, cellar and pits.
Jones & Yates 1 Pickrell, SW SW 5-19-26, drilling 1,015 ft.
Manetas 1 Lane, SE NE 13-21-28, drilling 450 ft.
Whiting Grant 1 Howell, NW SE 32-20-25, drilling 808 ft.
Lea County, Brewer Drlg. Co. 1 Mitchell, SE SE 17-17-32, drilling 2,150 ft.
Cave 1 Cunningham, SW SW 22-19-35, location.

TEXAS PANHANDLE

AMARILLO Tex., June 23.—Attributed mainly to a trend toward general betterment of the oil industry, together with an increased demand for Panhandle type crude, the great Panhandle district report last week recorded the greatest number of new locations for any one 7-day period in the history of oil in the Panhandle area.

Completely overshadowing the previous week's record-equaling high of 34 new locations, one operator alone staked 34 new tests during the past week which brought the total to 58 new locations. Hutchinson County led with 42 new sites, Gray County received 13, Carson County 2 and Wheeler County 1.

Completions in the field showed an increase over the week previous with a total of 14 wells finaled. The total initial production for the week from the new wells amounted to 2,863 bbl.

PANHANDLE COMPLETIONS

Carson County

Buchta & Riley 2 Lewis, 129 bbl., pumping, 1,500 gal acid, 3,000-65 ft.
E. W. Means 4 Cooper "C," 39 bbl., pumping, 240-qt shot, 3,141-77 ft.

Gray County

King Oil 11 Simpson, 220 bbl., pumping, 120-qt. shot 3,218-70 ft.
Coronado Oil 1 Jackson, 173 bbl., 460-qt. shot, 3,010-80 ft.
Rock Oil 2 Vicars, 210 bbl., pumping, 220-qt. shot, 3,251-91 ft.
Stanolind 14 Waggoner, 66 bbl., pumping, 440-qt. shot 3,175-3,305 ft.
Shell 12 Finley-Hoffman, 289 bbl., pumping, 150-qt shot, 2,820-2,900 ft.
Skelly Oil 123 Schaffer, 382 bbl., pumping, 330-qt. shot, 3,248-3,310 ft.
Taylor Oil 3 Taylor "B," 303 bbl., pumping, 440-qt. shot, 2,860-2,965 ft.

Hutchinson County

Benonine Oil 15 Starnes, 222 bbl., pumping, 580-qt. shot, 3,126-92 ft.
J. E. Crosby, Inc., 40 Pitts, 376 bbl., pumping, 490-qt. shot, 2,715-2,815 ft.
Phillips 2 Starnes, 57 bbl., pumping, 240-qt. shot, 3,095-3,149 ft.
Stanolind 25 Watkins "A," 218 bbl., pumping, 625-qt. shot, 2,930-3,033 ft.
Stekoll Oil 40 Whittenburg, 179 bbl., natural, pumping, 3,035-3,150 ft.

California Fields

(Continued from Page 109)

mainder of this company's leases expire between July and December. Honolulu Oil Corp. is nearing the 14,500-ft. mark in its deep test in the Buena Vista Hills anticline in Kern County.

SAN JOAQUIN VALLEY COMPLETIONS

Coalinga Northeast, Fresno County: Texas 1 Grass, 30-19s-16e, shut in, no test made, T.D. 8,240 ft., perf. 8,215-40 ft., no flow test was made and hence no production figures available.
Coalinga Southeast, Fresno County: R. S. Lytle 77-7-F, 7-20s-16e, flowed 2,026 bbl., 31.4-gravity, 0.7 per cent cut, 1,272,000 cu. ft. gas, 21/64-in. bean, pressures 1,150/1,260 lb., T.D. 8,208 ft., 100-mesh perf. 7,599-8,208 ft., completed in Gatchell oil zone of Eocene age; Kreyenhagen 6,964 ft., green sand 7,507 ft., Gatchell 7,533-8,184 ft., bottomed in Gatchell silt.
Standard 78-13-C fee, 13-20s-15e, flowed 4,034 bbl., 30.6-gravity, 1 per cent cut, 2,770,000 cu. ft. gas, 44/64-in. bean, pressures 850/1,150 lb., T.D. 7,791 ft., 60-mesh perf. 7,580-7,791 ft., completed in Gatchell zone of Eocene age; Kreyenhagen 6,125 ft., oil sand 7,528-7,791 ft.
Coles Levee, Kern County: Ohio 15-F Kern County Land, 11-31s-25e, flowed 200 bbl., 34.3-gravity, 0.1 per cent cut, 200,000 cu. ft. gas, 13/64-in. bean, pressures 950/1,800 lb., T.D. 9,850 ft., perf. 9,436-9,848 ft., completed in Stevens zone of Miocene age.
Mount Poso, Kern County: General Pet. 18 Heisen, 16-27s-28e, pumped 280 bbl., 15.6-gravity, 1.5 per cent cut, T.D. 1,859 ft., perf. 1,805-59 ft., completed in Vedder zone of Miocene age 1,808-59 ft.
Shell 14 Vedder Rail, 9-27s-28e, pumped 364 bbl., 15.5-gravity, 10 per cent cut, T.D. 1,998 ft., perf. 1,925-97 ft., completed in Vedder zone of Miocene age 1,903-97 ft.
Shell 15 Vedder Rail, 9-27s-28e, pumped 403 bbl., 15.6-gravity, 3 per cent cut, T.D. 2,000 ft., perf. 1,895-1,965 ft., completed in Vedder zone of Miocene age 1,896-2,000 ft.
Rio Bravo, Kern County: Superior 4 Curtis, 28-28s-25e, flowed 1,517 bbl., 39.5-gravity, 0.1 per cent, 1,972,000 cu. ft. gas, 24/64-in. bean, pressures 1,600/1,700 lb., T.D. 11,446 ft., 120-mesh perf. 11,327-11,446 ft., completed in Rio Bravo zone 11,324 ft. and Vedder zone 11,406-46 ft., Miocene age.
Round Mountain, Kern County: Trico O. & G. Co. 8 Coffee, 8-28s-29e, pumped 240 bbl., 17.3-gravity, 2 per cent cut, T.D. 1,460 ft., 120-mesh perf. 1,350-1,460 ft., completed in Vedder zone of Miocene age.
Tupman, Kern County: Richfield 85-29-A Kern County Land, 29-30s-25e, flowed 1,242 bbl., 33.2-gravity, 3 per cent cut, 900,000 cu. ft. gas, two 128/64-in. beans, pressures 150/700 lb., T.D. 9,285 ft., perf. 8,797-8,952 ft., 8,999-9,145 ft., 9,181-9,281 ft., completed in Stevens zone of Miocene age.
Wildcat, Kings County: Blair Oil Co. 1 Reef Ridge, 24-23s-16e, abandoned in shale at 1,000 ft., no casing used, no oil or gas showings of importance.
Wildcat, Kern County: Kern Valley Drlg. Co. 1 Edison, 30-30s-30e, abandoned in gray sand at 900 ft., 14-in. surface pipe 100 ft., 8⅝-in. casing 308 ft., formation test 308-600 ft. water, no oil or gas.

SAN JOAQUIN VALLEY OUTPOSTS

Belridge, Kern County: Sentinel Oil Co. 1 Belridge, 10-28s-20e, drilling 2,862 ft. in sand and blue shale, elev. 731 ft.
Elk Hills, Kern County: Standard 42-31-S fee, 31-30s-24e, T.D. 8,021 ft. in shale, fishing drill pipe, elev. 1,122 ft.
Standard 45-19-S fee, 19-30s-24e, drilling 8,617 ft. in oil sand, elev. 707 ft.
Standard 7-33-S fee, 33-30s-24e, rigging up, elev. 59 ft.
Kettleman North Dome, Kings County: Standard 1-1-U fee, 1-23s-16e, T.D. 12,296 ft., milling drill collar and bit, elev. 693 ft.
Midway-Sunset, Kern County: North Amer. Oil Consd. 1-28 W. P., 28-32s-23e, T.D. 7,824 ft. in very hard shale with streaks of tight impervious sand, checking log, elev. 1,560 ft.

SAN JOAQUIN VALLEY WILDCATS

Buena Vista Hills district, Kern County: Honolulu 25-P fee, 10-32s-24e, drilling 14,460 ft. in hard fine gray silty sand of Miocene age, objective is Rio Bravo and Vedder zones, elev. 916 ft.
Texas 9 Thornber, 34-31s-24e, drilling 4,599 ft. in sand and shale, elev. 404 ft.
Burrell district, Fresno County: General Pet. 1 Burrell, 2-17s-18e, building rig and hauling in drilling equipment.
Buttonwillow district, Kern County: Texas 47-15 Southern Pacific, 15-29s-24e, T.D. 11,852 ft., drilling in sand and shale, elev. 287 ft.
Superior 13 Kern County Land, 18-29s-25e, drilling in sand and shale 10,245 ft., set pipe above oil showing at 10,110 ft., elev. 313 ft.
Bellevue district, Kern County: Ohio 1-G Kern County Land, 36-29s-26e, drilling 8,437 ft. in sand and shale.
Union 31-3 Kern County Land, 3-30s-26e, drilling 11,840 ft. in sand and shale, Stevens oil zone absent.
Dyer Creek district, Kern County: Shell 46-11 Smith, 11-26s-27e, building rig and hauling in drilling equipment.
Famosa district, Kern County: C. C. M. O. 12-1 Famosa, 12-27s-26e, drilling 5,880 ft. in sand, top Olcese

zone 3,838 ft., gray Vedder sand 5,011 ft., being drilled by Bell & Loffland, General Pet. and Richfield contributing dry-hole money.

Lafayette district, Contra Costa County: Lafayette Oil Co. 1 Morris, 28-1n-2w, drilling at 1,161 ft. in sandy shale.

Lost Hills district, Kern County: Associated 46-16 fee, 16-27s-21e, drilling in sandy shale 3,998 ft., elev. 424 ft.

Maricopa district, Kern County: Bankline 24-24 Sunset, 24-11n-23e, temporarily suspended in gray siltstone at 4,345 ft., top Etchegoin 2,960 ft., elev. 970 ft.

Bankline 57-23 Sunset, 23-11n-23e, drilling in blue shale 1,104 ft., elev. 1,000 ft.

Monocline Ridge district, Fresno County: Seaboard Oil Co. 1 Hagood, 6-17s-13e, location staked 2,845 ft. S, 695 ft. E from NW cor. section.

Pyramid Hills district, Kings County: Pyramid Prod. Co. 2 Spreckles, 16-24s-18e, drilling in surface sand 135 ft., elev. 673 ft.

Raisin City district, Fresno County: Shell 1-19 Santa Ana and Fresno Land, drilling in sand and shale 4,482 ft.

Rio Vista district, Sacramento County: Amerada 1 Ranpone, 31-4n-3e, drilling in sand and shale 3,891 ft., elev. 3 ft.

Rio Vista district, Solano County: Amerada Pet. Corp. 1 Calif. Lands, 3-3n-3e, drilling 4,283 ft., P.B. 3,920 ft., gas sand appears wet, elev. 1 ft.

Jergins Oil Co. 1 Twitchell, 8-3n-3e, location staked 330 ft. S, 1,200 ft. E from NW cor. section.

Superior 1 Larson, 8-3n-3e, location staked 330 ft. S, 1,023 ft. E from NW cor. section.

Superior 1 McCormack, 9-3n-3e, location staked 3,680 ft. N, 330 ft. E from SW cor. section.

Sacramento district, Sacramento County: Portable Drlg. & Equip. Co. 1 Sacramento, 35-8n-4e, T.D. 297 ft. in surface sand.

Sharkey Landing district, Glenn County: Holly Sugar Co. 1 fee, 32-22n-1w, drilling 2,567 ft. in sand and shale, elev. 32 ft.

Shafter district, Kern County: Continental 2-G Kern County Land, 35-27s-24e, T.D. 11,349 ft., redrilled to 11,041 ft., P.B. 1,050 ft., redrilling 4,553 ft.

Tejon district, Kern County: Richfield 2-A Tejon, 19-11n-18e, drilling in sand 2,784 ft.

Important Test Under Way West of Del Valle Field

Interest in the Coastal district this week centered in the Del Valle area where Jasper Petroleum Co. is working on either an extension well in the Del Valle field or a wildcat in a new possibly productive area This well is located about 7,500 ft. west of the nearest producing well in the Del Valle field and it remains to be seen what its status is. From a geological standpoint this well is located on a new anticline and the area between the well and the Del Valle field is crossed by the San Martinez fault. This fault tends to indicate that Jasper 1 Videgain in 17-4n-17w is located on a separate accumulation. This wildcat is at present standing cemented but is scheduled to be drilled out late next week and if a water shut off is made the company plans to core ahead for another 150 ft. before making a formation test. This well has cored 95 ft. of oil sand and shale but at its present depth there seems to be some question as to whether the well will flow. Jasper 1 Videgain is the best looking well drilling in the Newhall-Castaic region at the present time.

R. E. Havenstrite is having considerable trouble with development work in the Del Valle field and this week suspended work on 3 Lincoln at 8,000 ft. This is the second duster drilled in this field by Havenstrite since he completed his discovery well last year. Previously he abandoned 1 Vasquez along the southern end of the structure. Suspension of work on 3 Lincoln and abandonment of 1 Vasquez means that Universal Consolidated Oil Co. will not drill its southerly location adjacent to these wells. On the major Pico anticline, Aztec Oil Co. has temporarily suspended work until new heavier equipment can be placed on ground as the original equipment proved unequal to drill past 4,300 ft. Aztec Oil Co. hopes to have equipment on ground shortly and resume work. The delay is due to the fact that water is scarce and the company must use some method other than steam power.

This company's deep test at 4,300 ft. is believed to be within 350 ft. of the first Modelo zone. The log shows it to be correlating 2,250 ft. higher than Barnsdall's wells on the Rancho San Francisco property in the Newhall-Potrero field. Top of the Miocene was found by Aztec Oil Co. at 4,275 ft. and good gas showings have been noted during the past 1,000 ft. The Newhall-Castaic area appears to have cooled off but another discovery will greatly stimulate additional drilling. Barnsdall Oil Co. is contemplating drilling a third test on the jail farm property near Castaic as soon as work is completed on the second test now drilling ahead around 5,200 ft. The first well was suspended pending the outcome of work on the second well. Oil sand has been found in both wells but the zone is not thick enough to produce and is too tight.

COASTAL DISTRICT COMPLETIONS

Del Valle, Los Angeles County: R. E. Havenstrite 1 Vasquez, 16-4n-17w, abandoned at T.D. 7,134 ft. in gray sand, 13⅜-in. surface pipe 372 ft., top Miocene 5,920 ft., top oil showings 7,020 ft., core 6,194-6,202 ft., recovered 12 ft. gray water sand.

Santa Maria Valley, Santa Barbara County: Signal O. & G. Co. 7 Yelkin, 26-10n-34w, pumped 200 bbl., 15.6-gravity, 5 per cent cut, T.D. 5,085 ft., perf. 4,724-5,085 ft., completed in Monterey formation of Miocene age.

Union 3 Stinson, 28-10n-34w, pumped 61 bbl., 14.8-gravity, 8 per cent cut, T.D. 5,225 ft., perf. 4,872-5,220 ft., completed in Monterey formation of Miocene age.

Ventura Avenue, Ventura County: Shell 139 Taylor, 29-3n-23w, flowed gas lift 409 bbl., 30.8-gravity, 70 per cent cut, T.D. 6,977 ft., perf. 5,963-6,046 ft. 6,125-6,208 ft., 6,249-6,308 ft., 6,387-6,628 ft., 6,711-6,974 ft., completed in oil zone of Pliocene age.

COASTAL DISTRICT WILDCATS

Aliso Canyon, Los Angeles County: Associated 1 Mission, 26-3n-16w, building rig and hauling in equipment.

Castaic district, Los Angeles County: Barnsdall 1-17-A Honor rancho, 5-4n-16w, T.D. 4,717 ft., in tight oil sand, temporarily suspended, excellent gas showings but little oil below 2,250 ft., drilling second test, elev. 1,317 ft.

Barnsdall 1-19-A Honor rancho, 7-4s-16w, drilling 5,172 ft. in gray sand and shale; elev. 1,244 ft.

R. W. Young 1 Walker, 11-4n-16w, rigging up, elev. 1,200 ft.

Del Valle district, Los Angeles County: Fred Jasper 1 Videgain, 17-4n-17w, drilling 5,984 ft. in oil sand and shale, correlating higher than adjacent wells, looks very good, top Miocene 5,600 ft.

R. E. Havenstrite 3 Lincoln, 16-4n-17w, T.D. 8,000 ft. in gray sand, first and second Miocene zones tested wet, showed salt water, looks bad, may abandon soon, elev. 1,102 ft.

Elwood district, Santa Barbara County: Barnsdall-Richfield 88-11 State, tideland, drilling 3,082 ft., will be Sespe test, elev. 21 ft.

Loma Grande district, Monterey County: Loma Grande Oil Co. 1 Corey, 23-24s-10e, T.D. 3,790 ft. in shale, fishing drill pipe, elev. 1,500 ft.

Los Flores district, Santa Barbara County: Standard 2 Los Flores, 27-9n-33w, drilling in sand and shale 5,020 ft., elev. 1,084 ft.

Newhall district, Los Angeles County: Aztec Oil Co. 1 Sanborn, 6-3n-16w, T.D. 4,300 ft. in sandy shale, moving in heavier equipment, elev. 1,516 ft.

St. Anthony Oil Co. 1 La Salle, 10-3n-16w, drilling in sand 1,964 ft., elev. 1,480 ft.

Tunnel Oil Co. 1 Needham, 13-3n-16w, graded road and location, expect production around 1,550 ft., elev. 1,681 ft.

Texas 1 Whitnah, 14-3n-16w, drilling 4,815 ft. in sand, testing, elev. 1,934 ft., located on major Pico anticline.

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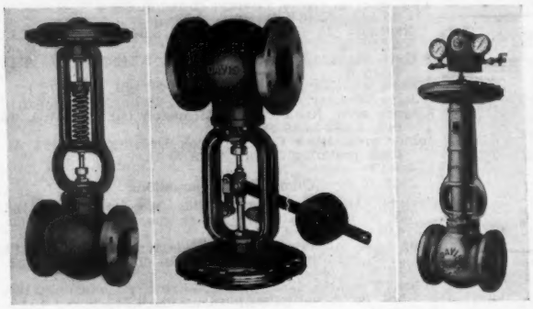

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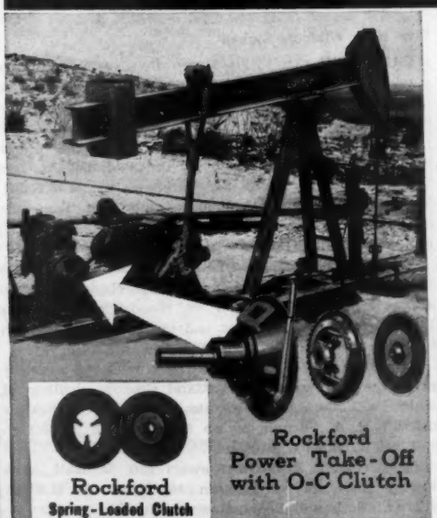

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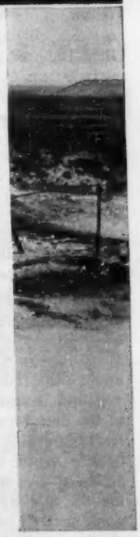

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Two Flank Wells at Willow Springs Showing Oil

By R. MARNE SANFORD

DALLAS, Tex., June 23.—Efforts of the past 2 years to develop oil production in the heretofore defined gas-producing Willow Springs field of Gregg County were apparently successful as two southwest-flank outposts were showing oil as the week closed. Producing from the Pettit zone at a depth of 7,308 ft., the Humble Oil 2 Horton-Dickson, E. Frost Survey, is being prepared for completion. Following a 2-week shut-in, when opened the well flowed 44 bbl. in 2 hours through 1-in. choke and then dropped to 33 bbl. during the next 2 hours. Pressure showed considerable drop during the run. Although oil production has been assured on the flank of the structure, the discovery well is not expected to be completed for a large daily potential.

SUMMARY OF COMPLETIONS

	No.	Bbl.	Footage
Oil wells: East Texas field*	8	266	28,849
Hawkins	2	625	9,498
Other fields	3	215	12,420
Gas wells: Cayuga	1	†85.0	4,075
Dry holes: Fields	2	.....	7,265
Wildcats	3	.....	17,126
Total	19	.....	79,233

*1-hour gage. †Million cu. ft.

The second outpost to the Willow Springs field, the Roger Lacy 1 Horton-Dickson, Meredith Survey, at last reports was still testing. Latest gage was 69 bbl. in 24 hours, 20 per cent acid and brackish water. The flow was through 22/64-in. choke under pressures of 1,000 lb. on casing and 900 lb. on tubing with gas volume estimated at 3,500,000 cu. ft. daily. The well is producing from perforations at 7,132-7,203 ft. in the Pettit, which has been acidized.

Two Wildcats Closely Watched

Considerable attention is being given two wildcats in eastern Texas. The British American Oil 1 M. G. Young, in the Joseph Rice Survey, 5 miles southwest of Athens, is contracted to the Travis Peak sand of the basal Trinity section and is the first Travis Peak test in west central Henderson County. The operator reported topping the Georgetown lime between 4,900 ft. and 4,910 ft. and is drilling below 4,978 ft. in the section. Casing is scheduled to be set as soon as the lime is based.

In Smith County the Iowa Payne 1 Spring Lake, 5 miles north of Tyler, in the John Lane Survey, was scheduled to reach contract depth by the end of the week. At last report the test was drilling below 4,840 ft. in sandy shale. From an elevation of 432 ft., the wildcat found the Pecan Gap chalk at 3,486 ft. and the Austin chalk from 4,625 ft. to 4,716 ft. The Woodbine section should be encountered by the first of the week.

Rusk County Drilling Program Starting

An eight-well drilling program for the Sears-Pool discovery area west of Laneville in Rusk County is in sight. Ross Sears, discoverer of the field, turned to M. D. Bryant a 125-acre tract on which will be drilled eight wells. The leases are all in the George May Survey and include the 34-acre L. H. Evans tract south of the discovery, calling for two wells; a 40-acre Evans tract adjoining this lease, calling for two wells; the 36-acre Ashby tract north of the discovery, two wells, and a 12-acre Pool tract and a 3-acre Pool tract, calling for one well each. However, at the close of the week activity was retarded pending official issuance of the permits by the Railroad Commission.

In the same area E. L. Baker has staked three new tests in addition to his 1 Evans which was reported last week. These three include the following: 2 Evans and 1 Watkins, in the Walters Survey and 1 D. R. Richardson, in the Sanchez Survey. None of the tests will be spudded until drilling permits have been received. Permit for 1 Evans is expected soon.

EAST CENTRAL TEXAS COMPLETIONS

Wildcats

Cherokee County: Bobby Manziel 1 Nagel, T. Simmons Sur., 3½ mi. NW of Mount Selman, dry at 5,041 ft.
Kaufman County: T. G. Shaw 1 Wynne, plugged at 6,767 ft.
Smith County: M. H. McMurray 1 Guilden & Becker, 26-acre tract in M. Culberson Sur., 1½ mi. W of Mount Sylvan, dry at 5,318 ft.

East Texas Field
(1-hr. gages)

Longview area, Gregg County: Lucey Pet. 9 R. Christian, 60 bbl., 3,592-3,603 ft., T.D. 3,614 ft.
Kilgore area, Gregg County: Houston Oil 5 J. S. Elder, 30 bbl., 3,546-3,604 ft.
Magnolia 24 Griffin, 40 bbl., 3,542-3,602 ft., T.D. 3,610 ft.
C. R. Stranes 47 Money, 20 bbl., 3,542-3,602 ft., T.D. 3,610 ft.
John Wrather A-26 I.&G.N.R.R., 33 bbl., 3,550-72 ft.
John Wrather A-28 I.&G.N.R.R., 33 bbl., 3,555-69 ft.
Kilgore area, Rusk County: Houston Oil 12 Laird, 45 bbl., 3,586-3,680 ft.
Joiner area, Rusk County: Cook Drilling Co. A-11 Alford, pumping 5 bbl., 3,578-90 ft.

Other Field Completions

Cayuga, Anderson County: Tide Water-Seaboard B-8 N. N. Wills, 85,000,000 cu. ft. gas, open flow, 3,989-4,014 ft., T.D. 4,075 ft.
Long Lake, Anderson County, Tide Water-Associated 12 J. O. Monning, 80.3 bbl., ⅞-in. choke daily, 5,152-82 ft., 5,234-46 ft.
Talco, Franklin County: Byrd-Frost 13 Phillips, 100 bbl. daily, pumping, perf. casing 4,214-38 ft., 4,188-93 ft.
Byrd-Frost 16 Phillips, dry at 4,255 ft.
Wortham, Freestone County: B. Carter 1 Manning, 35⅝ bbl. daily, 94 per cent water, pumping, T.D. 2,981 ft.
Van, Van Zandt County: Olsen Oil 1 Riggs, dry at 3,010 ft.
Hawkins, Wood County: Humble Oil 1 Parrish, 359 bbl. in 18 hr., ¾-in. choke, T.D. 4,710 ft.
Humble Oil 1 Price, 65½ bbl. in 6 hr., ¼-in. choke,

(Continued on Page 126)

West Central Texas Fields

(Continued from Page 101)

the Noodle Creek pool in southwestern Jones County was reported at the close of the week. This well is the W. W. Fondren 1 Hodges and is producing at 3,070 ft. from the Swastika lime zone. Official gage placed the flow at 26.19 bbl., pumping, daily.

Five New Wildcats Staked

CALLAHAN COUNTY.—Merry Bros. & Perini have spudded a projected 3,200-ft. Palo Pinto lime test 10 miles southeast of Abilene. It is 1 Sam DeSpain, in Section 32, Block 3, S.P. Survey.

STONEWALL COUNTY.—A deep wildcat for Stonewall County has been staked by the Shell Oil Co., Inc. The test will be 1-A J. D. Patterson, Jr., a 6,700-ft. Ellenburger project. It is located 1,676 ft. from the north and 1,021 ft. from the west lines of Section 257, Block D, H.&T.C. Survey, 10 miles west of Jayton.

HASKELL COUNTY.—Drilling will soon start on a scheduled 1,750-ft. wildcat in southeast Haskell County. Staked as J. W. Crites 1 T. G. Hendrick, the test is 1,636 ft. from the northeast and 450 ft. from the south lines of a 206-acre lease in the J. Fenner Survey.

EASTLAND COUNTY.—Two new wildcats were located the past week in Eastland County, drilling of which will start at once. Sims Drilling Co. has located 1 E. A. Vernon, on an 80-acre lease in Section 9, Block 2, H.&T.C. Survey.

The second is Bryan & Stewart 1 G. D. Hall, on a 40-acre tract out of Section 46, Block 2, H.&T.C. Survey. Both will be shallow-sand tests.

WEST CENTRAL TEXAS COMPLETIONS

Wildcats

Brown County: Guyle Greynolds 1 Crownover, 4,070,000 cu. ft. gas per day, 5,000 gal. acid, 2,895-2,948 ft., T.D. 2,955 ft., P.B. to 2,948 ft.
Callahan County: G. J. Kleiner 2 Williams, dry at 1,080 ft.
Coleman County: J. O. Hart & Sons 1 Peyton, dry at 1,660 ft.
Shackelford County: T. S. Stanfield 1 Ficher, dry at 984 ft.
Ellis A. Hall 1 Dyer, dry at 1,264 ft.

Fields

Brownwood Gas, Brown County: A. A. Elms 1 Fetty, 300,000 cu. ft. gas per day, 3,000 gal. acid, 1,265-1,509 ft.
Lewis, Jones County: Fain-McGaha Oil 9 Ann Shahson, dry at 2,051 ft.
Nowles, Jones County: J. C. Hunter 1 Hazel Strand "B," 18 bbl. oil and 30 bbl. water daily, 3,455-58 ft.
Royston, Fisher County: General Crude Oil 12 Flanigan, dry at 6,746 ft.
Miscellaneous, Brown County: Janellen Oil 3 Barnes, 3,550,000 cu. ft. gas per day, 1,142-70 ft.

WEST CENTRAL TEXAS ACTIVE WILDCATS

Brown County: Harry E. Murray 1 Fry, 900 ft. from NE and 900 ft. from NW lines John Williams 33, 1,400-ft. cable-tool test, H.F.W. at 571 ft.
Callahan County: Ungren & Frazier 1 Russell, 360 ft. from N and 1,000 ft. from W lines Sec. 118, B.B.B. &C. Sur., 1,250-ft. test, running 7-in. casing 945 ft.
Merry Bros. & Perini 1 Sam DeSpain, 767 ft. from E and 3,100 ft. from S lines Sec. 32, S.P.R.R. Sur., Blk. 8, 3,200-ft. rotary test, derrick, moving in material.
W. D. Austin 1 I. N. Jackson, 150 ft. from N and W lines Sec. 2, C.&M. Sur., S.D. 982 ft.
Coleman County: West Coast Prod. Corp. 1 Morris, SW cor. of NE 160 acres, J. Greenwood Sur. 308, drilling 2,720 ft.
States Oil 1 Sealy & Smith, NE 160 acres of J. Greenwood Sur. 304, set surface casing.
McKissick & Robertson 1 Finley, 467 ft. from S and 934 ft. from W of SW cor. Sec. 22 but in Sec. 45, T.&N.O. Sur., Blk. 2, 3,500-ft. rotary test, drilling at 1,130 ft.
Comanche County: O. L. Stutenrouth 1 Pearl Kirk, 660 ft. from N and 2,820 ft. from S lines John Talbot Sur. A-941, 2,800-ft. cable-tool test.
Concho County: Nixon & Abernathy 1 Riley, 585 ft. from S and 819 ft. from E Sec. 1705, G. C. F. Blanchard Sur., Abst. 1225, 1,200-ft. cable-tool test, spudded and S.D.
Floyd C. Dodson 1 Robert Wilson, Thomas Green Sur., 10 mi. SW Eden, drilling 3,949 ft.
Eastland County: Sabens & West 1 Hall, on section line between Secs. 100 and 93, Blk. 3, H.&T.C. Sur., 3,500-ft. test, drilling below 700 ft.
Dobbs Oil 1 Hightower, NE SE Sec. 4, Blk. 3, H.& T.C. Sur., 3,100-ft. test, drilling at 1,682 ft.
Bryan & Stewart 1 Hall, 330 ft. from N and E lines SE Sec. 46, Blk. 2, H.&T.C. Sur., drilling 1,160 ft.
Fisher County: F. A. Stephenson 1 Humphries, NW NW Sec. 49, Blk. 1, H.T.&B. Sur., P.B. to 2,987 ft., prep. to deepen.
P. R. Long 1 Maberry, SE cor. A. A. Soring Sur., 2 mi. SW of McCaully, show oil 3,279-89 ft., set casing 3,289 ft.
Hamilton County: Lone Star Gas Co. 1 Burks, 1,654 ft. from NE and 1,175 ft. from NW lines James Hayes Sur. 16, Pat D-705, 3,000-ft. test, top Marble Falls 2,565 ft., perf. casing 2,654-74 ft., 2,609-19 ft., 2,585-95 ft., 1,000 gal. acid, prep. to retest at 2,712 ft.
Hood County: Aztec Oil 1 Gallagher, SW SE Robert Alway Sur., 3,000-ft. test, S.D. 2,825 ft.
Jones County: M. C. L. Corp. 1 M. A. Swanson, 467 ft. from W and 660 ft. from N lines Sec. 187, B.B.B. & C. Sur., 3,300-ft. rotary test.
T. J. Coyne 1 L. E. Clyburn, NW cor. tract in Lots 24 and 27, Holt subdivision of Henry Millard Sur. 243, 2,000-ft. test, drilling 1,312 ft.
W. D. Brookover 1 W. C. Church, SE cor. Lot 88, Godwin subdivision of De Witt C.S.L. Sur., 2,600-ft. test, bottomed at 2,438 ft., set casing.
M. J. Delaney 1 Short, 467 ft. from S and E lines of SW Sec. 191, B.B.B.&C. Sur., 3,300-ft. rotary test, drilling 800 ft.
Falls Ref. Co. 1 Spurrier, 370 ft. from S and 1,620 ft. from W lines of Lot 1, Wm. C. Walker Sur. 6, drilling 1,831 ft.
J. J. McMahon 1 Miller, 400 ft. from S and 330 ft. from E lines Lot 13, Warren Subdivision 125, running 7-in. casing 2,469 ft.
Palo Pinto County: Hickok Prod. and Reynolds 1 Halsell, 467 ft. from S and W lines Sec. 92, B.B.B.&C. Sur., Abst. 105, 5,500-ft. test, P.B. to 4,520 ft., reshot 80-qt. 4,420-45 ft., S.D. orders.
W. K. Gordon 1 J. S. Crouch, 3,300 ft. from S and 290 ft. from E lines Sec. 87, Blk. 3, T.&P. Sur., 3,500-ft. test, drilling 2,455 ft.
F. Guyer 1 Dalton, L. B. Dayton Sur., Abst. 153, show gas 3,918-27 ft. and 3,933-48 ft., S.D. at 4,000 ft.
Parker County: J. L. Higginbotham 1 Wheeler, SE cor. J. B. Brannon Sur., Abst. 1928, 5,000-ft. test, fishing at 4,099 ft.
Shackelford County: Aragon Oil 1 Walls Pasture, SW cor. Sec. 39, B.A.L. Sur., 4,000-ft. test, pulling on stuck 8¼-in. casing 2,940 ft.
Kleiner & Dickey Bros. 1 Miller, NW cor. Sec. 571, T.E.&L. Sur., 750-ft. test, drilling below 190 ft.
R. H. Roark 1 Elliott, SW SW SE Sec. 9, L.A.L. Sur., 5,000-ft. test, drilling 1,535 ft.
U. L. Miller 1 Rodriquez, NE cor. Sec. 12, E.T. Sur., 750-ft. test, S.D. 603 ft.
E. M. Dolach 1 Cook, SE SE NE Sec. 64, E.T. Sur., S.D. 1,110 ft.
Somervell County: Plymouth Oil 1 Cousins, 457 ft. from SE and NE lines of tract in John Echols Sur., 7,500-ft. test, drilling 2,829 ft.
Stephens County: C. Andrade III 1 Walls Pasture Co., NE cor. Sec. 13, O.A.L. Sur., 3,800-ft. test, S.D. 3,709 ft.
Stonewall County: Hunter, Roberts & Shouts 1 Boyd, 660 ft. from S and E lines of NW Sec. 28, Blk. D, H.&T.C. Sur., drilling 800 ft.
Shell 1-A Patterson, 1,650 ft. from N and 990 ft. from W lines Sec. 357, Blk. D, H.&T.C. Sur., Ellenburger test, rigging up rotary, 6,800-ft. test, moving in material.
Taylor County: Ce-Beth Oil 1 City of Abilene, south shore of Lake Abilene on city property, 4,000-ft. test, fishing 3,600 ft.
C. J. Kleiner 1 Jackson, 10,200 ft. from W and 2,100 ft. from S lines Alexander Thompson Sur. 20, 2,500-ft. test, drilling 1,735 ft.
W. H. Peckman 1 Perry, 330 ft. from N and W lines Lot 5, Lge. 124, Grimes County School Lands Sur., underreaming 8¼-in. casing from 1,970 ft., T.D. 2,019 ft.

Kellersburg Anticline To Be Tested by Oriskany Well

By STAFF CORRESPONDENT

PITTSBURGH, Pa., June 23.—A new deep test starting in Southwest Pennsylvania will be of major importance as it will test a structure of considerable extent and in an area hitherto untested. In West Franklin Township, Armstrong County, T. W. Phillips Gas & Oil Co. et al will drill to the Oriskany sand on the W. T. Beidenbach farm, located 3 miles due north of the town of Worthington on Route 422. It starts at an elevation of 1,170 ft. on the west flank of the Kellersburg anticline.

SOUTHWEST PENNSYLVANIA

In Beaver Township, Pennsylvania, the wildcat of L. D. McMichaels et al resumed drilling through the Onondaga lime where it had been bottomed at 5,434 ft. on the Elmer Pflug farm on Big Knob in New Sewickley Township, with few feet remaining to drill into the Oriskany sand. A bad cave from the overlying shales stuck the tools. The line has been whipped off and the hole is being cleaned out to start fishing.

SUMMARY OF COMPLETIONS

Southwest Pennsylvania

	No.	Bbl.	Footage
Gas wells	1	*0.2	2,395
Dry holes	2	.....	4,718
Total	3	.....	7,113

West Virginia

	No.	Bbl.	Footage
Oil wells	3	31	5,283
Gas wells: Oriskany	1	*11.0	5,173
Others	8	*4.7	15,716
Dry holes	1	.....	2,025
Total	13	.....	28,197
Recompletions	3	†18	.....

*Million cu. ft.
†Includes 0.3 million cu. ft. gas.

In Center Township, Beaver County, St. Joseph Lead Co. reached 4,940 ft. in the deep test on the J. P. Koehler estate and at that depth a gas blowout from a pocket upset the tools and caused a fishing job. The tools are now below the Tully lime, which in this section is represented by shells and shale, and drilling through the particularly difficult shales in which gas pockets of considerable power are frequently encountered. Tools have often been driven great distances up the hole with subsequent caving and fishing jobs. Often a column of heavy brine is carried in the hole which reduces the forces of the explosion so that the tools are merely staggered as the force is more slowly dissipated.

On Chestnut Ridge in Fayette County, Peoples Natural Gas Co. is drilling 4 Piedmont Coal Co. at 5,331 ft. and No. 5 at 2,540 ft. Here, New Penn Development Co., William E. Snee et al are drilling 1 Carothers at 720 ft. and have just received the last of the materials to start rigging up 1 Kirby. These operators will deepen 1 Piedmont Coal Co. just above the watering trough on Route 40. It is bottomed only 16 ft. in the Oriskany sand. Greensboro Gas Co. is rigging up to start 1 Barton. In North Union Township Wasson & Co. et al have not deepened 2 Sorg. The gas from the Oriskany and Onondaga chert is turned in the line.

On Laurel Ridge in Stewart Township, Fayette County, New Penn Development Co. et al are drilling at 8,227 ft. in the wildcat on the Gregg L. Neel farm, and are still in Onondaga chert. It was reported that the Oriskany sand had been reached but on petrographic studies it was decided that a hard quartz vein had been crushed and the fragments closely resembled, under a low-power glass, Oriskany sand clusters. In Maryland these operators have made headway in the test on the Humberson (Shartzer) farm on the Accident dome in Garrett County and are drilling at 5,398 ft.

COMPLETIONS

Fayette County, Menallen Township: Eberly et al 1 Kolansky, 185,000 cu. ft. gas, Fifty-foot sand 2,358 ft., gas 2,369-74 ft., gas 2,373-78 ft., T.D. 2,395 ft.
Nicholson Township: Greensboro Gas Co. 1 Louisa Lowe estate, dry through Fifth sand, T.D. 2,747 ft.
Washington County, Fallowfield Township: Equitable Gas Co. 1 P. B. Irwin, dry, T.D. 2,971 ft.

WEST VIRGINIA

In Poca district, Kanawha County, 1 Haynes heirs of the Rex Oil & Gas Co. reported as an oil well in the Salt sand is larger than expected and was bottomed at 1,624 ft. It produced 400 bbl. in 8 days. The Salt sand was topped at 1,295 ft.

In Monongalia County the wildcat of the Hope Natural Gas Co. on the H. C. Greer et al lease in Morgan district is drilling at 5,225 ft. In Lewis County, the rotary test of the Hope Natural Gas Co. on the Albert Woofter farm in Freemans Creek district is drilling at 1,000 ft.

COMPLETIONS

Boone County, Washington district: Owens, Libby-Owens 24 Little Coal Land Co., 103,000 cu. ft. gas, Berea, T.D. 2,420 ft.
Calhoun Township: Hope 8541 Jeff L. Kelly, 680,000 cu. ft. gas, Big lime 1,500-1,604 ft., Big Injun 1,604-59 ft., gas 1,619-50 ft., T.D. 1,685 ft.
Sherman district: Hope 8539 Cora Stump, 784,000 cu. ft. gas, Big lime 1,765-1,845 ft., Big Injun 1,845-1,925 ft., gas 1,895-1,915 ft., T.D. 1,950 ft.
McCall Drilling Co. 1 Grover S. Kelly, 576,000 cu. ft. gas, Salt sand 1,830-50 ft., Maxton sand 1,864-1,900 ft., Big lime 1,999-2,050 ft., Big Injun 2,050-2,152 ft., gas 1,833-45 ft., gas 2,132-51 ft., T.D. 2,204 ft.
Lee district: Hope No. 7499, deepened, 225,000 cu. ft. gas and 18 bbl. oil while cleaning out, started 2,045 ft., Big lime 2,053-2,152 ft., Big Injun 2,152-2,206 ft., gas 2,185-97 ft., oil 2,197-2,206 ft., T.D. 2,231 ft.
Washington district: Hope 8548 Jarvis & Witt, 1,088,000 cu. ft. gas, Big Dunkard 782-860 ft., Salt 1,162-92 ft., gas 1,170-92 ft., T.D. 1,192 ft.
Gilmer County, Center district: Carnegie 1555 W. D. Hoover, in slate below Injun sand, dry, T.D. 2,055 ft.
DeKalb district: Carnegie 1556 Coleman L. Peters, 8 bbl., Maxton sand, T.D. 1,482 ft.
Troy district: A. E. Ellis 1 L. and E. White, 168,000 cu. ft. gas, Big Injun 1,680-1,770 ft., gas 1,693-1,720 ft., gas 1,750-60 ft., T.D. 2,100 ft.
Pleasants County, McKim district: Hart Oil Co. 4 Marion Hart, 3 bbl., Injun sand, T.D. 2,000 ft.
Ritchie County, Murphy district: L. P. Bickel 1 Benjamin W. and Leland S. Morris, 142,000 cu. ft. gas, Injun sand, T.D. 2,155 ft.
A. H. Jackson 2 Elizabeth Campbell, drilled deeper, 75,000 cu. ft. gas, Injun sand, T.D. 2,004 ft.
Union district: Moats & Barker 3 H. C. Moats, 1,170,000, cu. ft. gas, Injun sand, T.D. 2,010 ft.
Roane County, Harper district: O. H. Reed et al 2 M. J. Hughes, 20 bbl., Salt sand 1,692-1,801 ft., gas and oil 1,787-1,801 ft., T.D. 1,801 ft.
Walton district: Clifton Oil & Gas Co. 2 G. A. Cummins, drilled deeper, dry, Big lime 2,490-94 ft., Berea 2,538-47 ft., T.D. 2,547 ft.
Wayne County, Union district: Owens, Libby-Owens 1 Willa J. Self, 27,000 cu. ft. gas, brown shale, T.D. 3,142 ft., plugged and abandoned.

ORISKANY GAS FIELDS

Kanawha County

No wells were completed in the Elk-Poca field in Kanawha County. Several wells are drilling in the Corniferous lime and should reach the pay soon.

Jackson County, Ripley district: United Carbon Co. 1 S. R. Miller, 11,000,000 cu. ft. gas before shot, Berea 2,530-50 ft., Corniferous lime 5,043-5,145 ft., Oriskany 5,145-73 ft., gas 5,152-73 ft., T.D. 5,173 ft., R.P. 1,400 lb. Here, several wells are in the Corniferous and should reach the Oriskany within the week.

Stripper Producers Demonstrate Water-Flood Operations

Oklahoma's stripper area in Nowata County, where secondary recovery operations in the past year or so have come to the fore, made a bid for recognition last week. A delegation of state officials and oil men were entertained by civic leaders of the town of Nowata on a tour through the water-flood areas at Delaware, Childers and East Nowata which are most affected by plans for the Oologah dam (The Oil and Gas Journal, Mar. 13, 1941).

The party, before hearing an address by Gov. Leon C. Phillips, made a motor trip over an area which has some 16,000 little wells, many of which have upped their production from around 2,000,000 bbl. a year to nearly 5,000,000 bbl. by water-flood projects. They were shown the Claud C. Harmon flood project in Township 27-16, in the Childers pool, where it is believed 5,140 acres can eventually be included in the secondary recovery projects now under way and were told that probably 30,880,000 bbl. remained to be brought out of the ground.

From the plant, the visitors could look across the valley to the West Extension area of the Childers pool, where 3,240 acres are declared suitable for flood and could, under that development, yield an estimated 12,960,000 bbl. The nearby Elliott area, with 380 acres of floodable land, is rated under that program to have a potentiality of 1,520,000 bbl., making a total estimated recovery for the region of 46,360,000 bbl. Stops were also made at the Forest Producing Co. Big Creek plant, at the H. C. Walter & Co. plant and the Phillips Petroleum Co. repressuring plant east of Nowata.

And at week's end, the Oklahoma Oil Corp., Okmulgee, Okla., petitioned the Corporation Commission for the right to repressure with water three leases in Section 12-17-15, in the Goble area of Wagoner County. Hearing on the request was ordered for June 24. Such projects, being planned almost monthly, would eventually account for tens of thousands of new wells in the stripper areas, it was believed.

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MICHIGAN OPERATIONS

Third Big Reed City Well Leads to Control Measures

By OTTO C. PRESSPRICH

SAGINAW, Mich., June 23.—Both to prevent waste and to conserve steel, at the request of the Office of Production Management, state control was clamped last week on the new Reed City oil pool in Osceola County by the state Oil Advisory Board. A public hearing was ordered for July 1 when it will be decided whether the emergency order shall be made permanent.

Confidence of Michigan oil operators that the new field will develop into a major oil pool was increased last week as a result of successful deepening of the second of two wells which had been small producers from a higher stratum. Pure Oil Co. drilled a new test deeper for a gusher with potential of around 3,000 bbl. a day. Weber Oil Co. deepened 1 Gable, discovery well completed last October, from 3,631 ft., where it had been pumping and flowing 30 bbl. a day, to 3,642 ft. The result is natural flow at an hourly rate of 70-80 bbl. The well is ½ mile south of Pure 1 Gingrich, which tapped the heavy flow, and Weber 1 Fatum, which had been completed at the shallower level last March.

State controls announced by P. J. Hoffmaster, supervisor of wells, impose proration of 480 bbl. a day per well, and require a 20-acre rectangular well-spacing pattern. The three wells now producing heavily, and four others being drilled are on 10-acre units. These, Mr. Hoffmaster said, will be allowed to continue, but all others must follow the 20-acre rule.

The order clears the way for a dozen other tests scheduled for the area where leases have been sought for as high as $600 an acre, with little available. Four major Michigan operators control the bulk of the leases within a 2-mile radius of present production.

Reed City's possibilities also promised to check the downward trend in Michigan oil production which in May totaled 1,132,554 bbl. The total, because of the longer month, exceeded April output by 22,000 bbl., but May's daily average of 36,534 bbl., was 468 bbl. less than the average in May 1940.

Midland's Porter-Yost and Clare's Winterfield Town-

(Continued on Page 137)

SUMMARY OF COMPLETIONS

	No.	Bbl.	Footage
Oil wells: Arenac County	1	64	2,982
Clare County	1	125	3,849
Ottawa County	1	20	1,887
Dry holes: Allegan County	2	.....	2,454
Clare County	1	.....	3,816
Montcalm County	1	.....	1,175
Ottawa County	2	.....	3,221
Van Buren County	2	.....	1,422
Total	11	.....	20,806

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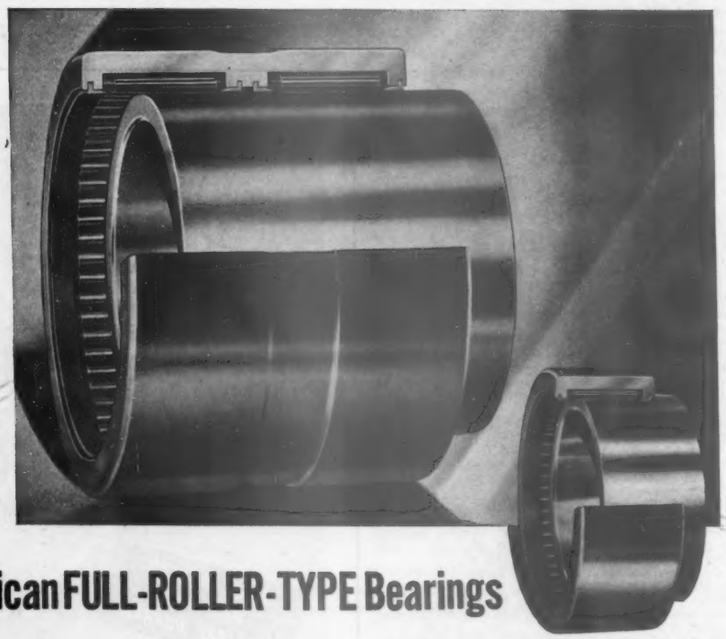

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AMERICAN
Heavy-Duty ROLLER BEARINGS

Southwest Texas Fields

(Continued from Page 118)

dry, T.D. 2,721 ft.
Jim Hogg County: Sun 5 East, dry, T.D. 4,548 ft.
Webb County: Houser & Campbell 1 Marshall, dry, T.D. 2,515 ft.

FIELDS

Casa Blanca, Duval County: Adelon 3-C Martin, 56 bbl., pumping, sand 1,121-32 ft.
Texas 42 Duval County Ranch Co., 39 bbl., pumping, sand 1,020-30 ft.
Chiltipin, Duval County: Gray & Wolfe 1-A Graham, dry, T.D. 4,880 ft.
Colmena, Duval County: Colmena 2-C Duval County Ranch, dry, T.D. 1,402 ft.
Colorado, Jim Hogg County: Humble 19-B King, 160 bbl., ¾-in. choke, T.D. 2,951 ft.
Driscoll, Duval County: Continental 66-A Driscoll, 194 bbl., ¼-in. choke, perf. casing 3,358-84 ft., T.D. 3,395 ft.
Holbein, Jim Hogg County: Guay A. Davis 2-A McLean, dry, T.D. 2,716 ft.
Hoffman, Duval County: Cox & Hamon 4 Plymouth, 80 bbl., ⅝-in. choke, perf. casing 2,586-2,612 ft., T.D. 3,159 ft.
Killam, Webb County: O. W. Killam 9 Garcia-Villareal, 70 bbl., pumping, perf. casing 2,005-15 ft., T.D. 2,053 ft.
O. W. Killam 10 Garcia-Villareal, 65 bbl., pumping, perf. casing 2,011-17 ft., T.D. 2,054 ft.
Manila, Jim Hogg County: Magnolia 49 Merchants State Bank, 25 bbl., pumping, sand 2,547-53 ft.
Rincon field, Starr County: Continental 36-A Slick, 16 bbl., gas lift, perf. casing 4,116-32 ft., T.D. 4,374 ft.
Continental 49-B Slick, 52 bbl., ¾-in. choke, perf. casing 4,224-48 ft., T.D. 4,323 ft.
Continental 92-B Slick, 202 bbl., ¾-in. choke, perf. casing 3,907-20 ft., T.D. 4,080 ft.
Continental 95-B Slick, 176 bbl., ¾-in. choke, perf. casing 3,916-28 ft., T.D. 4,433 ft.
Sarnosa, Duval County: Magnolia 1 Weil, dry, T.D. 3,305 ft.
White Creek, Live Oak County: Holland & Smith 5 Bonham, 35 bbl., pumping, perf. casing 1,392-1,401 ft., T.D. 1,402 ft.

SOUTH CENTRAL FIELDS

Bee Creek, Caldwell County: Ralph Ogden 11-A Miears, 446 bbl., 12 hr., pumping, T.D. 2,209 ft.
Chicon Lake, Medina County: Val Fearis 1-A Medina Irrigation, 3 bbl., pumping, sand 414-21 ft., T.D. 425 ft.
La Coste, Bexar County: W. M. Peacock & Summer 1 fee, gas well, T.D. 1,202 ft.

Eastern Texas Fields

(Continued from Page 124)

perf. casing 4,658-68 ft., 4,677-89 ft., 4,710-24 ft., T.D. 4,788 ft.

EASTERN TEXAS WILDCAT REPORT

Anderson County: Huddleston & Prater 1 Praff, R Allen Sur., 5 mi. NW Palestine, drilling 1,600 ft.
Cecil & Stein 1 Davey & Royal, 375 ft. from N and 402 ft. from W lines 160-acre tract in M. Rogers Sur., drilling 427 ft.
Angelina County: S. D. McDaniel 1 Bonner, Sarah Odel Sur., T.D. 1,210 ft., P.B. to 1,020 ft., S.D.
Cherokee County: Bobby Manziel 1 Douglas, 467 ft. from W and 227 ft. from N lines of 79-acre tract in I. W. Brock Sur., 2½ mi. SW of Bullard, first report.
Gregg County: Roger Lacy 1 Flannigan, 8,450 ft. from S and 1,555 ft. from W lines H. Edwards Sur., 8 mi. S of Willow Springs field, first report.
Henderson County: British American Oil 1 Young. Joseph Rice Sur., 7½ mi. SW of Athens, top Woodbine 4,138 ft., Georgetown lime 4,905 ft., T.D. 4,978 ft.
Rusk County: Ross Sears 1 Pool, George May Sur., Laneville area, 4,128 ft., making 7 bbl. per day and 55,000 cu. ft. gas, S.I. 4,128 ft.
R. S. Kirby 2 Hall Wood, old well drilling deeper, 9 mi. W of Laneville, J. I. Sanches Sur., old T.D. 4,201 ft., new T.D. 4,207 ft., preparing to drill ahead.
Smith County: Iowa-Payne Oil 1 Spring Lake Club, John Lane Sur., 5 mi. N of Tyler, Austin chalk 4,625 ft., T.D. 4,841 ft.
O. L. Ross 1 Rishing, SW cor. of J. P. Rushing tract in Jacob Herrin Sur., 2 mi. SE of Whitehouse, first report.
Wood County: Fred Browning and J. C. Robbins 1 M. N. Andrews, SW cor. J. R. Smith Sur., 9 mi. N of Hawkins, location.

MISSISSIPPI AND SOUTHEAST

Sharkey County Wildcat Will Be Drilled Deeper

By GEORGE WEBER

JACKSON, Miss., June 23. — Active wildcat drilling was quiet during the past week, as Tinsley activity continued strong. Several new wildcat tests are being planned in Mississippi and Alabama. The outstanding current wildcat test which has produced some oil, will be deepened.

British American Oil Prod. Co. 1-A Houston estate, which indicated a new field discovery, will be deepened to contract depth of 5,000 ft. it was announced last week. Drilling contractor has cemented the open hole below the 7⅝-in. casing seat at 3,278 ft., and 3-in. drill pipe is being moved in for drilling slim hole from the present depth to 5,000 ft.

SUMMARY OF COMPLETIONS

	No.	Bbl.	Footage
Oil wells: Tinsley ...	2	1,622	10,089
Dry holes	1	.....	7,074
Total	3	.....	17,163

The best swabbing gage made on the test showed 415 bbl. of fluid in a 24-hour period, consisting of 82 per cent salt water and 18 per cent of 24-gravity oil. The oil upon analysis showed very little gasoline content, but the ulbricating oil fraction is of good quality. Failure to shut off salt water incited operators to carry the well deeper.

New Wildcats Planned

A wildcat test for Madison County, Sinclair Wyoming Oil Co. 1 Charles L. Harris, 26-10n-5e, was staked last week, and a drilling contract is being sought. Other tests are scheduled for early drilling by Slick-Urschel Oil Co. and by Tatum, Dunbar & Shaddock both in Yazoo County. Other wildcats are scheduled in Scott and Warren counties, and Hinds County, one of the scenes of blocking recently may see further drilling this summer.

In Alabama, Lauderdale and Winston counties are active, with a test tentatively staked by Ellis & Reasor in the latter county. A wildcat is also being promoted in Blount County, Alabama.

Tinsley Spacing Pattern to Be Decided by Court

Although indications point to a reduction in close drilling recently allowed in Tinsley, due to the government request for wider well spacing and saving of required steel casing, several tests are under way on small tracts. However, due to the petition of two operators in the field, F. H. Broocks was last week restrained by Chancery Court of Yazoo County from drilling 1 Robinette, 19-10-2, on a 1¾-acre tract. A hearing was set for September. The field was developed in an orderly manner on 40-acre spacing prior to the recent abandonment of the spacing pattern by the state Oil and Gas Board.

New interest was aroused on the southwest edge of the Tinsley field, as Union Producing Co. 2 Middleton, in the NW cor. 36-10-3, showed a thickening of the Woodruff zone. The area west of the recently developed southeast extension area has not been explored, since to the north, the Woodruff zone pinches out on structure. The tendency to thicken to the west, as indicated in 2 Middleton, will bring new interest to drilling in the field.

Standard Oil Co. of Louisiana, principal outside purchaser of crude at Tinsley, reduced purchases to an average of 47-50 bbl. per well per day last week. Crude from Tinsley is now moving to four outside states for refining, in addition to the small movement to Vicksburg. Louisiana receives the bulk of export shipments, while Illinois and Tennessee take crude for small refineries. Production last week averaged normal, at 27,450 bbl. daily.

MISSISSIPPI COMPLETIONS

Wildcats

Yazoo County: Sinclair Wyoming Oil Co. 1 C. C. Swayze, W½ E½ W½ 23-12n-1e, T.D. 7,074 ft., dry.

Fields

Tinsley, Yazoo County: Lutz Johnson and W. R. Snead 1 G. W. Stutts, NW SW SW 31-10-2, 917 bbl., 28/64-in. choke, T.P. 50 lb., T.D. 5,059 ft., 7-in. casing 5,059 ft., Woodruff zone 4,943-5,002 ft., perf. 4,942-80 ft.

Union Producing Co. 1 W. W. Cowan, SE SE 26-10-3, 705 bbl., 32/64-in. choke, T.P. 65 lb., C.P. 90 lb., T.D. 5,030 ft., 7-in. casing 5,026 ft., Woodruff zone 4,664-91 ft., perf. 4,662-90 ft.

MISSISSIPPI ACTIVE WILDCATS

Chickasaw County: Century Oil Co. 1-A Flaherty, S½ SW SW 8-13s-3e, drilling by fish at 2,000 ft.

Copiah County: Ze Nae Oil Co. 1 W. W. Broom, SW SW SW 1-9n-8e, T.D. 2,903 ft., S.D.

Grenada County: Grenada County Drlg. & Dev. Co. 1 Conn. General Life, NW SE 28-23-5, T.D. 3,743 ft., S.D.

Kemper County: Darrell C. Williams et al 1 McKelvain, SE NE 2-9n-17e, T.D. 1,050 ft., S.D., W.O.

Leake County: Sinclair Wyoming Oil Co. 1 Pearl River, NW SE NW 28-9n-6e, drilling 7,325 ft.

Montgomery County: Henderson Oil Co. 1 School Lands, SE NE NW 16-19n-6e, T.D. 3,720 ft., S.D.

Sharkey County: British American Oil Prod. Co. 1-A Houston estate, NW NE SW 23-11-7w, T.D. 3,303 ft., cemented open hole below 7⅝-in. casing 3,278 ft., moving in 3-in. pipe to deepen to 5,000 ft.

Stone County: Danciger Oil & Ref. Co. 1 Stone County, SE SW 16-2s-11w, set 13⅜-in. casing 2,201 ft., T.D. 2,235 ft., W.O.C.

ALABAMA WILDCATS

Clarke County: Union Prod. Co. 1 M. M. Waite, C NW, 27-8n-1w, drilling 4,054 ft.

Franklin County: E. O. Heath, Jr. 1 W. O. Hester, SW SW 4-6s-12w, drilling 837 ft.

Canadian Fields

(Continued from Page 120)

will map the Cardston area and H. A. S. West the Pincher Creek area.

In Saskatchewan a party headed by G. M. Furnival is to cover a potential oil and gas area of 4,500 sq. miles in the southwestern part of the province.

Ontario Completions

Chatham Township: Union Gas 35, Lot 17, Concession 9, T.D. 1,628 ft., 325,000 cu. ft. gas.

Union 36, Lot 15-11, dry at 1,658 ft.

Canboro Township: A. Ricker, Lot 10, Concession 1, 20,000 cu. ft. gas.

Dereham Township: Aloka Oil & Gas Co., dry.

Malahide Township: Union Gas 63, Lot 21, Concession 5, T.D. 1,056 ft., 565,000 cu. ft. gas.

Middleton Township: Dominion Natural Gas, Lot 41, Concession 2 S.T.R., dry at 1,200 ft.

Oneida Township: Union Gas 259, Lot 10, West Plank Road, dry, 625 ft.

Union 260, Lot 22 East Plank Road, T.D. 745 ft., 35,000 cu. ft. gas.

Colborne-Welland Gas Co., Martindale farm, T.D. 650 ft., 6,000 cu. ft. gas.

Tuscarora Township: Petrol Oil & Gas 101, Lot 11, Concession 6, T.D. 600 ft., 40,000 cu. ft. gas.

Windham Township: Dominion Natural Gas, Lot 13, Concession 14, 195,000 cu. ft. gas at 1,195 ft.

Dominion Natural Gas, Lot 21, Concession 14, dry at 1,150 ft.

Woodhouse Township: Walters Gas Syndicate, Lot 10, Concession 3, dry at 1,100 ft.

Rocky Mountain Runs

Average daily production June 21

Salt Creek	14,300
Lance Creek	27,870
Lost Soldier	5,090
Oregon Basin	5,990
Wertz	5,490
Total Wyoming	86,250
Total Montana	19,240
Total Colorado	3,970
Eunice	18,250
Monument	19,010
Vacuum	13,010
Artesia-Maljamar	20,980
Total New Mexico	113,870

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Personal Paragraphs

LT. BEN F. CARTER, formerly petroleum engineer in the Beeville district for United Gas Pipe Co., has been ordered to active duty with the coast artillery at Camp Wallace, Texas.

R. A. BROOMFIELD, executive vice president of Barnsdall Oil Co., with offices in Los Angeles, Calif., received the first gold button set with a diamond when service buttons were awarded last week to members of the California division. T. P. CALNAN and W. F. HOOLEY, each with 20 years' service, also received diamond-studded service buttons.

EVERETT L. DAVIDSON, assistant engineer with United Gas Pipe Line Co., has been transferred from the general office in Shreveport, La., to Dallas, Tex.

S. F. SHAW, consulting petroleum geologist, San Antonio, Tex., recently returned from an extended business trip to the Turner Valley field, Canada.

N. V. LAMB, chemical engineer for Standard Oil Co. of New Jersey, and stationed at Aruba, West Indies, and his wife and daughter are visiting his parents who live near Bristow, Okla.

E. E. DeBACK, vice president, Stratton Pipe Line Co., at Corpus Christi, Tex., addressed the South Texas Geological Society last week on "A Discussion of Cycling and Equipment."

K. S. ADAMS, president, Phillips Petroleum Co., Bartlesville, Okla., has been appointed to represent petroleum interests in the state committee to guide the United States defense-savings program in Oklahoma.

FREDERIC R. PRATT, son of HERBERT L. PRATT, former chairman of the board of Socony-Vacuum Oil Co., and himself an official of that company, was chairman of the petroleum committee for the New York City U. S. O. campaign.

RALPH WILLS, of Anglo-Canadian Oil Co., and RICHARD GIBBONS, of Halliburton Cementing Co., both American citizens, were chairmen of the Victory Loan campaign in Turner Valley, Alta., Canada. Turner Valley was the first community in Canada to exceed its quota in the $600,000,000 campaign.

LYNN MILAM, Houston Oil Co., geological department in Houston, Tex., has passed a 4-month training course for the U. S. Navy, received his ensign's commission, and is now in the Pacific on the U. S. S. Lawrence.

R. S. STEWART and RICHARD LOVE, assistant engineers of the Texas Co., Salem, Ill., will leave shortly for St. Louis, Mo., where they will be inducted into the U. S. Army. HERMAN HARRIS, formerly engineer in the core-analysis laboratory of the Texas Co. at Salem, is now in the Army Air Corps training unit at Muskogee, Okla.

LT. JAMES H. ECHTERHOFF, chemical engineer with United Pipe Line Co., in the general office, Shreveport, La., is now on active duty in the Engineer Corps, Fort Belvoir, Virginia.

HAROLD C. MILLER, of San Francisco, Calif.; H. B. HILL, Dallas, Tex.; BOB CURTIS, Bartlesville, Okla., and CHARLES B. CARPENTER, of Dallas, all engineers with the U. S. Bureau of Mines, have been in South Arkansas conferring with O. C. BAILEY, chairman of the Arkansas Oil and Gas Commission regarding a joint field reservoir study that the two bodies plan to undertake this summer.

GEORGE C. NANCE has retired from the Mene Grande Oil Co., Venezuela, after 24 years of service with the Gulf companies. Mr. Nance joined Gulf's Houston, Tex., office in 1917, where he remained until his transfer to the company's Tampico, Mexico, office in 1922. From that office he went to the New York office of South American Oil Co. in 1928, going the following year with Venezuela Gulf Oil Co. and remaining with that company's successor, Mene Grande, until his retirement. Mr. Nance has returned to Dallas, Tex., where he and Mrs. Grace Dabbs are to be married. They will locate on a small farm in Mississippi, Louisiana, or Texas.

Do You Remember?

From The Oil and Gas Journal Files

25 YEARS AGO

At Nowata, Okla., the Star Oil & Gas Co. has been organized by F. L. Berrian, H. R. Strother, and N. S. Brown, to operate on land 12 miles southeast of that town.

The yacht Casiana, of the Huasteca Petroleum Co., arrived at Port Aransas, Tex., from Tampico, Mexico, bringing 92 American and British refugees from the oil fields. The yacht made preparations to return immediately for a second cargo.

A. E. Humphrey and James Whiteside, both of this state (Oklahoma), are drilling in Wyoming, locations having been made for them by F. J. Fohs, geologist, of Tulsa.

20 YEARS AGO

In the past years the oil business has undergone many slumps. Oil men of long experience have become accustomed to them. But at no time were conditions similar to those of the present depression in the business.

Maurice Sweitzer, aged 70 years, a pioneer oil man of California and for many years a resident of San Francisco, recently died in that city. He was originally identified, as a partner, with the Keith & Mack oil syndicate which was active in the Kern River field.

10 YEARS AGO

Henry McGraw, vice president of the Gypsy Oil Co., and the Gulf Pipe Line Co. of Oklahoma, died Friday, June 19, in Johns Hopkins Hospital in Baltimore, Md. The oil industry has lost a constructive leader and society has lost a great-hearted man.

Sidney H. Keoughan, formerly president of the Continental Oil Co., recently became president of the North European Oil Co., following the conclusion of a deal involving 1,600,000 acres of prospective oil land in Germany.

RUFUS D. HODGE, engineer-operator at Cox City, Okla., has been awarded a 20-year service button by Oklahoma Pipe Line Co.

DICK REESE, former scout for Pure Oil Co., and BONNIE HEATH, former scout and land man for Ryan Oil Co., have organized Reese & Heath, Inc., and have opened an office in Carmi, Ill.

AL BEASLEY, scout for Shell Oil Co., Inc., with headquarters at Jackson, Miss., has been transferred to Lake Charles, La., to relieve BAKER HOSKINS, who is on temporary leave of absence due to ill health.

A. B. BARNETT has severed his connections with the Harbar Drilling Co. and the Cetal Drilling Co., and has started his own company, which will be known as Barnett Drilling Co., with headquarters in Wichita, Kans.

HARRY E. ZOLLER, executive vice president and general manager of Derby Oil Co., Wichita, Kans., has been made a member of the Kansas Industrial Development Commission. He was appointed by Governor Ratner.

JAMES S. HIGDON, employe at the Ponca City, Okla., refinery of the Cities Service Oil Co., has been awarded the National Safety Council's President Medal, for saving the life of Mrs. Max Winder of Ponca City last November.

M. W. BOWEN, New York, foreign trade executive of Socony-Vacuum Oil Co., Inc., has been made assistant director of the Division of Emergency Shipping. His duties in the Maritime Commission deal with coordination of tanker operations.

JOHN A. BAILEY, engineer, Shell Oil Co., Inc., has been transferred from McPherson, Kans., to Pampa, Tex.

J. W. McCRACKEN, welder for United Gas Corp., Wellington, Tex., has been transferred to Jackson, Miss., effective July 25.

J. W. PATTON, SR., of Lewisville, Ark., has been named to the Oil and Gas Commission of the state, and attended his first state-wide hearing in that capacity last week in El Dorado.

A. W. CLINGER, of the Pennzoil Co., Oil City, Pa., was elected president of the Purchasing Agents Association of northwestern Pennsylvania at a dinner meeting of the group last week.

ALEX CLARKE is in charge of a new Shell Oil Co., Inc., office that has been opened in Calgary, Alta., Canada. He will carry on some preliminary survey work in various parts of the province.

JOHN PATRICK CUSACK, son of JACK CUSACK, oil operator of Fort Worth, Tex., and at one time a scout for Skelly Oil Co., has been graduated with high honors from Vanderbilt University.

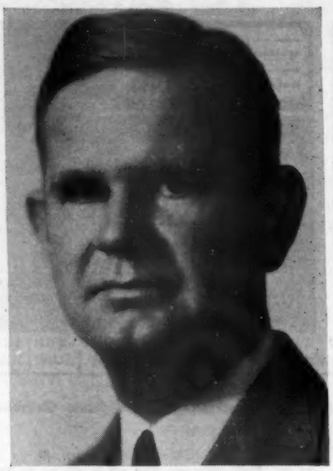
R. B. ROARK, vice president, Shell Oil Co., Inc., Tulsa, was principal speaker and presented service awards to 71 Shell employes with service records of 20 and 25 years' service at luncheons held last week.

AUBREY M. OWENS, pumper-roustabout at Seminole, Okla.; HARVE R. ELDER, pumper at St. Elmo, Ill.; and CHARLES F. MOSELY, field repairman at Plaquemine, La., have been awarded 20-year service awards by Carter Oil Co.

MURRAY CHRISTIAN, formerly in the land department of Shell Oil Co., Inc., at Centralia, Ill., has resigned and will take up new duties with Superior Oil Co. at Houston, Tex. TOM BOWLES of the Centralia office will succeed Mr. Christian as head of the title and rental section in the land department.

Up the Hard Way

James W. Vaiden, newly appointed vice president of the Skelly Oil Co. in charge of manufacturing, climbed the ladder the hard way. By nature extremely reserved, his superiors have had to learn from someone else the favorable results of his efforts for the company's good. But this may be just the reflection of his southern ancestry. Born in Uniontown, Ala., he was surrounded with the refinement of a young southern gentleman. The same influences followed Jim through Marion Military Institute. This fitted him for a place in the 117th U. S. Field Artillery, and before the close of the World War he was wearing gold bars on his uniform. Jim's understanding of men and his "plugging" attitude might be explained by citing certain other early experiences. For example, he taught mathematics and chemistry and coached football and baseball in Alabama and Louisiana high schools.



JAMES W. VAIDEN

His introduction to oil came in 1924 when he joined a labor gang constructing the company's Burbank, Okla., gasoline plant. His bachelor's degree in chemical engineering from the Alabama Polytechnic Institute of course was not a prerequisite for this job but this combination of hard work and technical background typifies the man and explains his ability to get things done. From this beginning he progressively became line walker, oiler, stillman, chemist, and finally superintendent of the plant which he helped to build. Later he was named plant superintendent at Stroud, Wynona, and Seminole, Okla., and Coleman, Tex. For the past several years Jim has been in active charge of the natural-gas and natural-gasoline departments of Skelly Oil Co. and has identified himself especially with the company's program of manufacturing and selling a long list of special petroleum solvents.

In his new office Mr. Vaiden will have executive supervision over the company's natural-gas and natural-gasoline departments and over the refinery at El Dorado, Kans. His headquarters will remain in Tulsa.

JAMES LARKIN McNEESE, temporary construction foreman for Carter Oil Co., has been retired after 21 years with the company. He has bought a farm and a mule near Bentonville, Ark.

DR. FREDERICK C. CLAPP, well-known geologist who worked the Cement, Kilgore and other southern Oklahoma structures in 1916 and 1917, is now located at Chickasha and is playing southern Oklahoma again.

GUS LINDQUIST, veteran employe of South Penn Oil Co., at Pleasantville, Pa., has been placed on the company's retired list after many years of service. Sixty-five friends honcred him at a party recently.

WIRT FRANKLIN, oil man of Ardmore, Okla., will address the Tulsa Chamber of Commerce June 27, on Harold L. Ickes and current problems in the oil industry. Mr. Franklin has worked with Mr. Ickes in the past.

HARRY L. NORRIS, scout for Sinclair-Wyoming Oil Co. in Illinois, with headquarters at Mattoon, has been transferred to the company's scouting department in the Rocky Mountain district with offices in Casper, Wyo.

M. C. HAGEN, former personnel manager at the Bayonne, N. J., refinery of Standard Oil Co. of New Jersey, has been named industrial relations supervisor for Lago Petroleum Corp., in the Maracaibo area of Venezuela.

ARTHUR ERICKSON, recently graduated from Oklahoma University at Norman, Okla., has been added to the geological force of the Phillips Petroleum Co. at Amarillo, Tex., to work in the Texas Panhandle district. He is a native of Valparaiso, Ind.

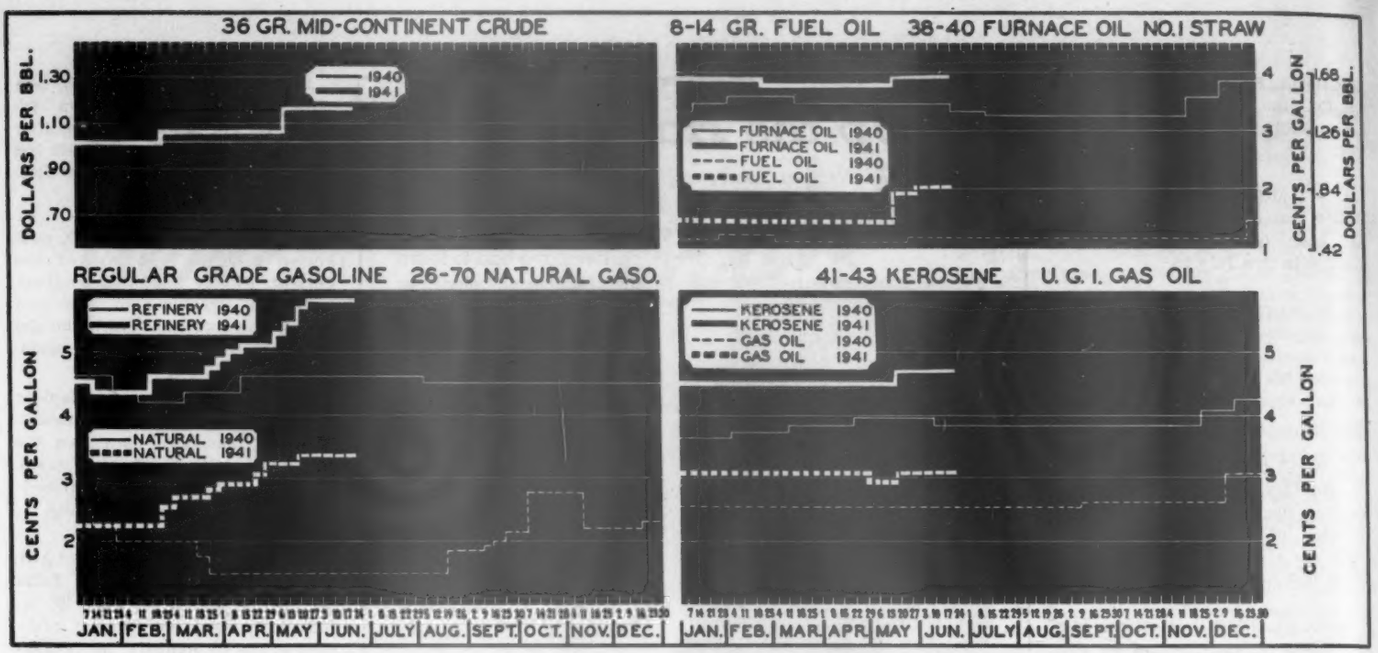
HIRAM NORCROSS, manager of Shell Oil Co., Inc., land department at Centralia, Ill., will be transferred to the company's offices at San Francisco, Calif., about September 1. VAL BILLUPS, of Shell's offices at Houston, Tex., will be transferred to Centralia to succeed Mr. Norcross.

Shifts: T. W. HAUGHT, superintendent, Ohio Oil Co., from Falfurrias, Tex., to Bay City, Tex.; L. I. BAKER, engineer, Texas Co., from Parks, Tex., to Midland, Tex.; CHARLES E. KNOX, JR., engineer, Knox Refining Co., from Norman, Okla., to Graham, Tex.; RONALD W. GRIBBLE, superintendent, Southern Union Gas Co., from Carlsbad, N. M., to Dallas, Tex.; THOMAS W. KEATING, engineer, Stanolind Oil & Gas Co., from Alvin, Tex., to Tulsa; J. L. MACKEY, engineer, Union Sulphur Co., from Iowa, La., to Lake Charles, La.; B. B. SPAULDING, geologist, Texas Co., from Salem, Ill., to Mattoon, Ill.; F. B. SLAGLE, engineer, Standard Oil Co. of New Jersey, from Cranford, N. J., to Linden, N. J.; H. W. JOHNSON, engineer, Standard Oil Development Co., from Elizabeth, N. J., to Chatham, N. J.; POWELL A. DENNIE, engineer, Shell Oil Co., Inc., from Tonkawa, Okla., to Tulsa; J. I. HULL, superintendent, Zephyr Drilling Co., from Wichita, Kans., to Tulsa; MARK H. O'CONNELL, geologist, Cities Service Oil Co., from Yoakum, Tex., to Jennings, La.; M. A. SPARKS, engineer, Sun Oil Co., from Corpus Christi, Tex., to San Miguel, Calif.; C. R. McGUFFIN, superintendent, Standard Oil Co. of Louisiana, from Trees, La., to Rodessa, La.; DEWEY T. ROSS, president, Dewey T. Ross Engineering Corp., from Tyler, Tex., to Washington, D. C.; C. L. WHITEMAN, engineer, Texas Co., from Effingham, Ill., to Beaver, Pa.; R. L. WALES, engineer, Texas Co., from Effingham, Ill., to Beaver, Pa.; DR. FRITZ HAUSSMAN, S.A. De Arbaneya La Florida, from Caracas, Venezuela, South America, to New York City.

CHARLES B. ARCHIBALD, who has been employed as a laborer at Shell's Vancouver refinery, has received his first promotion. He is now a chemist at the company's Shellburn, B. C., refinery.

B. A. HARDEY, chairman of the Minerals Board, State of Louisiana, and L. M. MOFFITT, secretary of Triangle Drilling Co., both of Shreveport, La., were called to Washington last week to confer with Secretary Harold L. Ickes.

CHARLES E. MOTT, vice president of Shell Oil Co., Inc., with offices in San Francisco, Calif., has been granted a temporary leave of absence in order to take important duties with the British Purchasing Commission in Washington, D. C.



Representative Mid-Continent Quotations on Crude Oil and Refined Products, Basis Oklahoma (Group 3)

New Advance on Lubricating Oils Sets Mid-Continent Refined-Market Pace

By H. STANLEY NORMAN

ANOTHER advance of 1 cent per gallon in the tank-car price for Mid-Continent bright stocks and neutral oils emphasized this week the growing strength of this market. Manufacturers of lubricating oils in the Mid-Continent have been lagging behind shipping instructions on lubricating oils for more than 2 months.

The latest advance, fourth in a series that started the middle of May, brings tank-car quotations on bright stock to a range of 18 to 23 cents per gallon. Neutrals are quoted at 10.5 to 17 cents, depending on specifications and light blended oils are offered at 12.2 to 19 cents. Demand for lubricating oil reaching refiners in the Mid-Continent district is increasing at a particularly rapid rate in middle-western states with large factories producing defense materials. Still, consumption by the average motorist appears to be increasing at a relatively sharp angle, judged solely on sales records in districts where manufacturing is of minor importance.

Other Product Prices Unchanged

Other Mid-Continent petroleum-product markets were strong this week at unchanged quotations. Buying pressure at midweek had reached its greatest intensity of the season as jobbers and distributors throughout the middle-western states prepared for the crush of July 4 holiday gasoline consumption. Exceptionally heavy motor-fuel consumption is anticipated this Independence Day because motorists will have a 3-day week-end available for longer trips.

A basic change in the relationship between Mid-Continent refiners and jobber customers is indicated by events of the past several weeks. For years there has been a certain portion of jobbers that depended entirely upon their ability to make satisfactory spot arrangements for needed products. Currently, the trend is concentrated on efforts of all jobbers to assure their source of supplies by contractual relationship with refiners.

Efforts to assure regular shipments of supplies is meeting opposition from refiners whose relation with jobbers is also changed by this year's substantial increase in consumption and by the outlook for duration of the defense emergency. Refiners are selling all supplies they are willing to load at current prices and are accomplishing this without particular effort. Any advantages that previously existed in the policy of giving jobbers an option on quantities of products specified in their contracts are reduced to a minimum, if not completely eliminated, by current conditions.

Refined Oil Market Barometer

Petroleum markets in many parts of the country are yielding to the artificial depressing influence of government price-control policies. Advances which appear justified by all normal concepts of price movement in eastern states have not developed for the chief reason that Leon Henderson, director of the Office of Price Administration and Civilian Supply, has asked that no action be taken until first submitted to his department.

MID-CONTINENT: Lubricating oils advanced 1 cent.

GULF COAST: Prices steady, otherwise featureless.

CALIFORNIA: Gasoline and fuel oil steady.

PENNSYLVANIA: Demand for most products strong.

CHICAGO: Jobbers scour market for gasoline.

Gasoline shipments from Mid-Continent refineries have been exceptionally heavy for the past 15 days. Two weeks ago jobbers started rebuilding inventories after reduced freight rates became effective. Heavier shipments to rebuild normal stocks is now overlapping with the annual bulge in jobber requirements caused by the July 4 holiday.

Routine Major Company Buying

Major companies are following routine practice in buying limited volumes of motor fuel from Mid-Continent refiners. Inquiries this week among refiners disclosed no unusual amount of major-company activity in the motor-fuel market. Observers had suggested that threats of a shortage in East Coast supplies might stimulate purchasing in the Mid-Continent section of supplies that would be moved to sections of the country on the borderlines of marketing divisions. Mid-Continent plant operators were unable to say that current buying efforts are confined exclusively to independent jobbers but there seems to be no decided departure from normal buying by major companies.

Regular motor fuel is quoted at a range of 5.875 to 6 cents per gallon in Group 3 territory for northern movement. Shoppers are meeting difficulty in obtaining supplies at the low figure of the range. Several refiners are turning down all prospective sales for duration of June and even through the middle of July because previous commitments will absorb their entire gasoline-manufacturing capacity.

Distillate fuel oils are moving at a moderate rate. Supplies are not being pushed on the market because most refiners are operating their cracking facilities at maximum capacity to produce as much gasoline as possible.

Price-Office Request Delays Eastern Market Movements

By J. P. O'DONNELL

NEW YORK, June 24.—Price advances that appeared imminent in the East Coast market early last week were apparently forestalled when Price Administrator Leon Henderson again requested that no advances be put into effect without prior consultation with his office. Mr. Henderson reiterated the request in Washington Thursday at the meeting of oil-industry representatives who met at the request of Coordinator Ickes to discuss methods of meeting the prospective East Coast supply problem.

While motor fuel of 72-74 octane remained quoted at 8 cents with very limited quantities available, there were reports of higher prices for No. 2 fuel oil and kerosene. According to these reports some suppliers were asking 5.5 cents for kerosene, 0.3 cent above the price generally quoted by major suppliers. Similarly some suppliers were reported to be holding No. 2 fuel oil for 5.25 cents, 0.35 cent above the generally quoted price level.

In his original request, Mr. Henderson said that advances in costs would be regarded as a legitimate reason for increased prices. That this factor is becoming more important in the East Coast area is self-evident. Pipe-line and barge-transported crude oil is higher in cost than that previously delivered by tanker exclusively and as quantities delivered by these methods increase, costs will rise correspondingly. Utilization of other methods such as that reported under consideration by Standard Oil Co. of New Jersey, bringing crude to Lima, Ohio, by pipe line and transporting it by rail to Bayway, would have a similar effect. Cost of crude delivered by this route would average approximately 30 cents per barrel more than that now being delivered by tanker.

This factor plus the anticipated improvement at the Gulf Coast is expected to result in further advances in the near future. The Gulf Coast improvement is based on the report that the United Kingdom will increase its purchases of United States oil to half of its total requirements as a result of a request of United States oil men who sought to offset the effect of the tanker diversion. Gulf Coast prices have been unchanged for some time, failing to improve as a result of the curtailed coastwise tanker capacity.

While tank-car prices in the New York Harbor area were reported virtually unchanged last week, there were reports of advances in tank-wagon prices of heating oil both in metropolitan New York and in surrounding suburban areas. According to these reports, sales of heating oil in New York were made at 7 cents per barrel and in neighboring New Jersey at prices above that level. This would be a minimum of 0.3 cent above the posted tank-wagon prices throughout this area.

The tank-car market remains nominal with most sales limited to contract purchasers and only small amounts being available on the spot market. This condition affects virtually all products from gasoline to lubricating oils. Lube oils were reported virtually unobtainable. Still, their prospects were regarded as doubtful following promulgation of the order banning further exports from the East Coast. The bulk of United States lubricating-oil exports leave North Atlantic ports and a curtailment of this market may have an adverse effect on the currently strong price structure.

Wax moved contrary to the general market again last week when prices were again advanced. At the close of the week crude-scale wax was reported held for 5.25 cents per pound though apparently some limited quantities are still available at 5 cents. The current top price is 2 cents above that of 6 weeks ago, a proportionately important increase.

Further evidence of the increased demand for motor fuel in the East Coast area was given last week when figures on sales of motor fuel in New York State became available. These figures show that taxable sales of gasoline in New York in April totaled 155,697,586 bbl., an increase of more than 17,500,000 bbl. from April 1940. This is an increase of 12.7 per cent.

Despite these evidences of increased consumption, the loss of tankers and repeated warnings of impending rationing, stocks of motor fuel on the East Coast have continued to rise. The advance in the second week of June amounted to only 50,000 bbl. in contrast to the substantial gain of the previous week, but it was significant in that it came in a week when withdrawals from storage were normal. During the first 2 weeks of June 1940, more than 250,000 bbl. of motor fuel were withdrawn from storage on the East Coast.

Small but significant increases were also made in East Coast stocks of gas oil and distillate fuel oil and of residual fuel oil. The former increased 350,000 bbl. and the latter 100,000 bbl.

The increasing quantities of products in storage on the East Coast have brought forth complaints from jobbers who claim that secondary suppliers are unable to obtain oil from the larger companies. Ross M. Sherman, chairman of the oil-burner industry emergency committee on national defense, is quoted as saying that he would submit affidavits to Secretary Ickes alleging that independent companies were unable to obtain supplies.

Other pertinent developments included an appeal from the State of New Jersey Legislature that gasolineless Sundays be avoided unless essential to national defense.

Coastal Prices Maintained Pending Transportation Break

HOUSTON, Tex., June 23.—Gulf Coast refiners continued to sit tight the past week awaiting developments in the transportation squeeze that has checked the movement of refined products and crude from this district. Little material is being sold or sought, yet quotations are firm. Only an occasional small-lot sale is made at prices below prevailing quotations.

During the week there was growing belief that some relief could be expected from the proposed shift of several tankers from California-Atlantic Coast service to the Gulf Coast and from suggested adjustments in routings and hauls of tankers. Many observers, however, continued skeptical that sufficient adjustments could be made to provide appreciable relief.

Anticipating increased demand shortly from Britain for United States oil, Gulf Coast refiners state they would be reluctant to sell now even if the material could be moved. This attitude, coupled with the recognition of the need for higher prices on the basis of present crude postings, is serving to encourage suppliers in the maintenance of present firm quotations.

The strength of the market quotations is reflected in the reported sale of a cargo of 80 research gasoline during the week at 6 cents. This price is slightly higher than previously quoted.

A.P.I. Weekly Refinery Statistics

Week Ended June 21, 1941

	Capacity reporting (per cent)	Total gasoline stocks (bbl.)	Residual fuel-oil stocks (bbl.)	Gas oil and distillate stocks (bbl.)	Daily crude runs (bbl.)
East Coast	100.0	22,620,000	8,450,000	9,725,000	587,000
Appalachian	91.0	2,924,000	442,000	356,000	134,000
Ind., Ill., and Ky.	90.2	17,118,000	3,420,000	3,467,000	620,000
Okla., Kans., and Mo.	76.9	7,711,000	2,007,000	1,406,000	308,000
Inland Texas	59.6	2,171,000	1,342,000	383,000	135,000
Texas Gulf	89.2	12,517,000	7,520,000	7,103,000	924,000
Louisiana Gulf	97.6	3,116,000	1,383,000	1,241,000	138,000
N. Louisiana and Ark.	51.5	369,000	482,000	284,000	41,000
Rocky Mountains	56.0	1,638,000	552,000	140,000	53,000
California	87.3	15,352,000	66,143,000	10,891,000	572,000
Total reported	86.2	85,536,000	91,741,000	34,996,000	3,512,000
Est. unreported	.....	6,380,000	1,540,000	740,000	333,000
Est. total	.....	†91,916,000	93,281,000	35,736,000	3,845,000
*Est. total previous wk.	.....	92,478,000	93,182,000	35,060,000	3,755,000
*June 22, 1940	.....	95,999,000	104,021,000	31,797,000	3,690,000

*Bureau of Mines. †Includes 7,243,000 bbl. aviation gasoline.

Stocks of Crude Oil in the United States

(BUREAU OF MINES ESTIMATE)

Week ended June 14, 1941	260,464,000 barrels
Week ended June 7, 1941	260,956,000 barrels
Week ended June 15, 1940	259,800,000 barrels

Figures do not include stocks of heavy, unrefinable California crude.

RETAIL OIL MARKETS...

Tank-wagon and filling-station prices on gasoline and kerosene furnished by larger marketing firms

Prices as of June 24, 1941

Taxes

The gasoline quotations given in the following tables include the 1½-cent federal tax, as well as state, county, and city taxes. The gasoline is the regular or standard grade. In most areas lower grades and a premium grade also are available.

Standard Oil Co. (Indiana)

	Gasoline Tank wag.	Dlr.	Inc. tax	Kero. tank wag.
Chicago, Ill.	15.1	13.1	4.5	10.3
Decatur	13.9	12.4	4.5	9.0
Joliet	16.4	13.6	4.5	10.3
Peoria	16.2	14.2	4.5	10.1
Quincy	14.9	13.4	4.5	10.0
Davenport, Ia.	16.2	14.7	4.5	10.1
Des Moines	15.9	13.9	4.5	9.8
Mason City	16.2	14.7	4.5	10.1
Duluth, Minn.	17.7	16.2	5.5	10.6
Mankato	17.4	15.9	5.5	10.3
Minneapolis	17.4	15.9	5.5	10.3
La Crosse, Wis.	17.4	15.9	5.5	10.3
Green Bay	17.7	16.2	5.5	10.6
Milwaukee	17.6	16.1	5.5	10.5
Detroit, Mich.	15.9	14.4	4.5	9.6
Grand Rapids	15.9	14.4	4.5	9.6
Saginaw	15.9	14.4	4.5	9.6
Evansville, Ind.	16.9	15.4	5.5	9.6
Indianapolis	17.1	15.2	5.5	9.8
South Bend	17.5	16.0	5.5	10.2
Fargo, N. D.	18.4	16.9	5.5	11.3
Huron, S. D.	17.8	16.3	5.5	10.7
Kansas City, Mo.	14.4	12.9	4.5	9.1
St. Louis	14.4	12.9	4.5	9.8
St. Joseph	15.7	14.2	4.5	8.9
Wichita, Kans.	14.8	12.7	4.5	8.0

*State tax 2 cents, 1-cent city tax, and 1½-cent federal tax.

Exclusive of state general sales taxes.

Discounts to commercial consumers. On purchases per month off tank-wagon prices: 1,000 gal. or more, 1.5 cents off, minimum delivery 25 gal.

Stanolex Fuel Oil in Chicago

Effective June 4, 1941, f.o.b. Chicago, tank-wagon prices: Standard heater oil, 1-99 gal., 8.75 cents; 100-149 gal., 7.75 cents; 150 gal. and over, 7.25 cents. Stanolex fuel oil No. 1, 1-99 gal., 8.5 cents; 100-149 gal., 7.5 cents; 150-399 gal., 7.25 cents; 400 gal. and over, 6.75 cents. Stanolex furnace oil, 1-99 gal., 8.5 cents; 100-149 gal., 7.5 cents; 150-399 gal., 7.25 cents; 400 gal. and over, 6.75 cents. Stanolex fuel oil A, 1-99 gal., 7.75 cents; 100-399 gal., 6.75 cents; 400-749 gal., 5.75 cents; 750 gal. and over, 5.0 cents. Stanolex fuel oil B, 1-99 gal., 7.75 cents; 100-399 gal., 6.75 cents; 400-749 gal., 5.75 cents; 750 gal. and over, 5.0 cents. Stanolex Bunker C fuel oil, 1-399 gal., 6.25 cents; 400-999 gal., 5.25 cents; 1,000 gal. and over, 4.25 cents.

Ohio

STANDARD OIL CO. OF OHIO

	Gasoline Cons'r tank wag.	Dlr.	Divided Inc. tax	Kero. tank wag.
Ohio points	16.0	15.0	5.5	*9.0

*Includes state tax of 1 cent.

Southern District

STANDARD OIL CO. (KENTUCKY)

	Gasoline Cons'r tank wag.	Net dlr.	Inc. tax	Kero. tank wag.
Atlanta, Ga.	17.75	17.75	7.5	10.0
Augusta	17.75	17.75	7.5	9.5
Macon	17.75	17.75	7.5	10.0
Savannah	16.75	16.75	7.5	9.0
Birmingham	18.25	18.25	8.5	8.0
Mobile	18.25	18.25	9.5	8.5
Montgomery	19.25	19.25	9.5	10.0
Jackson, Miss.	16.75	16.75	7.5	9.0
Vicksburg	16.75	16.75	7.5	8.5
Jacksonville, Fla.	17.75	17.75	8.5	8.0
Miami	17.75	17.75	8.5	8.0
Pensacola	18.25	18.25	9.5	8.0
Tampa	17.75	17.75	8.5	8.0
Lexington, Ky.	16.75	16.75	6.5	9.0
Covington	15.0	15.0	6.5	9.0
Louisville	16.25	16.25	6.5	8.5
Paducah	16.25	16.25	6.5	8.5

Price basis to tank-wagon consumers, effective January 4, 1937, 3 cents per gallon below tank-wagon price.

Montgomery, Ala., has a county tax of 1 cent per gallon, and a city tax of 1 cent per gallon on gasoline, in addition to state tax, and 1 cent per gallon on kerosene. Mobile, Ala., has a city gasoline tax of 2 cents per gallon; Birmingham, Ala., has a city gasoline tax of 1 cent per gallon; Pensacola, Fla., has a city gasoline tax of 1 cent. All are included in the table.

Atlantic Coast District

STANDARD OIL CO. OF NEW JERSEY

	Gasoline Cons'r tank car	Dlr. tank wag.	Inc. tax	Kero. tank wag.
Atlantic City	13.0	14.0	4.5	7.8
Newark	13.0	14.0	4.5	7.8
Annapolis	13.85	15.35	5.5	9.5
Baltimore	13.25	14.75	5.5	8.5
Cumberland	14.65	16.15	5.5	10.0
Washington, D. C.	11.50	13.00	3.5	9.0
Danville, Va.	15.45	17.45	6.5	10.25
Norfolk	14.25	16.25	6.5	10.00
Petersburg	14.55	16.55	6.5	11.00
Richmond	14.55	16.55	6.5	11.00
Roanoke	15.75	17.75	6.5	10.50
Charles'n, W. Va.	15.55	18.05	6.5	11.5
Parkersburg	14.85	17.35	6.5	11.2
Wheeling	15.25	17.35	6.5	11.8
Charlotte, N. C.	17.40	18.90	7.5	9.3
Hickory	17.95	19.45	7.5	10.3
Mount Airy	17.80	19.30	7.5	9.5
Raleigh	17.15	18.65	7.0	10.3
Salisbury	17.45	18.95	7.5	10.7
Charleston, S. C.	15.25	17.75	7.5	9.25
Columbia	16.10	18.60	7.5	(*)
Spartanburg	16.80	19.30	7.5	(*)

Price basis to Essolene undivided dealers: Dealer tank-wagon price less 0.5 cent per gallon. Price basis to commercial consumers, effective March 8, 1937, in Maryland, District of Columbia, and in Arlington and Fairfax counties in Virginia and March 12 in New Jersey: To contract accounts purchasing at least one full compartment at a time by hose connection, on yearly purchases: From 2,500 to 100,000 gal., consumer tank-wagon price at time and place of delivery: 100,000 gal. per year, consumer tank-car price plus 0.5 cent per gallon. Consumer tank-wagon price generally will be equivalent to dealer tank-wagon price less 0.5 cent per gallon.

Effective January 16, 1939, in North Carolina the commercial consumer schedule became as follows: Single deliveries of 50 gal. or more, consumer tank-wagon price. Single deliveries of less than 50 gal., 4 cents per gallon over consumer tank-wagon price. Generally the posted consumer tank-wagon price will be equivalent to the dealer price, less 0.5 cent per gallon. The above policy also applies in South Carolina, effective January 23, 1939.

*Kerosene business of the company at these points now exclusively handled by dealers.

Pennsylvania and Delaware

ATLANTIC REFINING CO.

	Gasoline Cons'r tank car	Dlr. tank wag.	Inc. tax	Kero. tank wag.
Philadelphia, Pa.	14.0	15.0	5.5	10.0
Pittsburgh	14.5	15.5	5.5	10.5
Allentown	14.5	15.5	5.5	10.5
Erie	14.5	15.5	5.5	10.0
Scranton	14.5	15.5	5.5	10.5
Altoona	14.5	15.5	5.5	10.5
Dover, Del.	...	15.5	5.5	10.5
Wilmington	...	15.0	5.5	10.0

Price basis to undivided dealers, dealer tank-wagon price less 0.5 cent per gallon.

Discount on kerosene, 2 cents per gallon off tank-wagon price on tank-wagon deliveries of 25 gal. or more at one time.

Pacific Coast Territory

STANDARD OIL CO. OF CALIFORNIA

	Gasoline Tank truck	Serv. sta.	Inc. tax	Kero. tank wag.
San Francisco	17.5	18.5	4.5	11.5
Los Angeles	17.0	18.0	4.5	10.0
Fresno, Calif.	18.5	19.5	4.5	12.5
Phoenix, Ariz.	21.5	22.5	6.5	*17.5
Reno, Nev.	20.5	21.5	5.5	13.5
Portland, Ore.	20.0	21.0	6.5	13.5
Seattle, Wash.	20.0	21.0	6.5	13.5
Spokane	21.5	22.5	6.5	16.5
Tacoma	20.0	21.0	6.5	13.5

*Includes 5-cent state tax.

Discount to dealers: On gasoline, off tank-wagon price, to 100 per cent dealers, 3 cents. To commercial consumers: On tank-wagon price; on single deliveries of 40 gal. and over, advance quantity discount extended at time of delivery, 3 cents. Service-station schedule applies on single deliveries less than 40 gal. On kerosene in tank-car, transport-truck, and trailer delivery, 3 cents off tank-wagon price; plant deliveries to jobbers, 2.5 cents below tank wagon.

March 18, 1939, split dealer discount was canceled.

New York and New England

SOCONY-VACUUM OIL CO., INC.

	Gasoline Cons'r tank car	Dlr.* tank wag.	Inc. tax	Kero. tank wag.
Albany	14.5	14.7	5.5	7.6
Met. New York	14.7	14.9	5.5	7.9
Buffalo	14.8	15.0	5.5	8.0
Rochester	15.4	15.6	5.5	8.8
Syracuse	15.1	15.3	5.5	8.7
Portland, Me.	14.9	15.1	5.5	8.0
Manchester, N. H.	15.9	16.1	5.5	8.9
Burlington, Vt.	15.5	15.7	5.5	8.2
Boston, Mass.	13.5	13.7	4.5	7.9
Worcester	14.1	14.3	4.5	8.0
Hartford, Conn.	14.2	14.4	4.5	7.5
New Haven	13.6	13.8	4.5	6.8
Providence, R. I.	13.6	13.8	4.5	7.7

*Undivided.

Effective August 8, 1940, the company changed its commercial consumer policy in New York and New England to the following:

Full compartment deliveries: Accounts buying less than 20,000 gal. annually, 0.5 cent above the commercial-consumer price; accounts buying from 20,000 to 120,000 gal. annually, commercial-consumer price; accounts buying 120,000 gal. annually and above, 0.25 cent off consumer price. Split compartment deliveries: Delivery of less than a full compartment, 250 gal., commercial-consumer price plus 1 cent. Steel-barrel deliveries: Commercial price plus 3 cents.

Rocky Mountain District

CONTINENTAL OIL CO.

	Gasoline Tank wag.	Inc. tax	Kero. tank wag.
Denver, Colo.	14.5	5.5	11.0
Grand Junction	18.0	5.5	12.5
Pueblo	14.5	5.5	9.5
Casper, Wyo.	17.0	5.5	12.0
Cheyenne	16.0	5.5	11.5
Billings, Mont.	18.0	6.5	12.5
Butte	17.0	6.5	13.5
Great Falls	17.0	6.5	12.5
Helena	17.0	6.5	13.0
Salt Lake, Utah	18.5	6.5	14.5
Boise, Idaho	†20.1	6.5	16.5
Twin Falls	†21.1	6.5	17.0
Albuquerque, N. M.	*17.5	7.0	10.0
Roswell	*15.5	7.0	8.5
Santa Fe	‡18.0	7.5	10.0

*Includes city tax of 0.5 cent. †Includes toll-bridge tax of 1 mill. ‡Includes city tax of 1 cent.

Tank wagon represents price to consumers. Dealer represents price to dealers. If no dealer price is quoted, the tank-wagon price applies to all classes of trade.

Central South District

STANDARD OIL CO. OF LOUISIANA

	Gasoline Cons'r tank car	Dlr. tank wag.	Inc. tax	Kero. tank wag.
New Orleans, La.	15.25	17.25	8.5	‡10.0
Baton Rouge	15.25	17.25	8.5	‡10.5
Alexandria	15.25	17.25	8.5	‡10.5
Lafayette	15.50	18.00	8.5	‡10.0
Lake Charles	15.50	18.00	8.5	‡10.0
Shreveport	14.50	17.00	8.5	10.0
Knoxville, Tenn.	18.00	20.50	8.5	12.5
Memphis	16.25	18.75	8.5	10.5
Chattanooga	17.50	18.50	8.5	12.0
Nashville	17.75	19.5	8.5	10.0
Bristol	18.25	18.75	8.5	12.0

Essolene at dealer price less 0.5 cent per gallon to undivided dealers.

‡Includes 1-cent state tax.

Price basis to commercial consumers: Effective May 15, 1937, deliveries of 50 gal. or more in one territory take posted consumer tank-wagon price. Accounts taking deliveries of less than 50 gal. at one time pay posted consumer tank-wagon price plus 4 cents per gallon. Generally, the posted consumer tank-wagon price will be equivalent to the dealer price less 0.5 cent per gallon. Kerosene prices include 1-cent state tax.

Effective February 24, 1939, the company reestablished in New Orleans the commercial consumer policy on motor fuel effective in the rest of the state.

Effective December 12, 1938, the company revised its commercial consumer policy on motor fuel in New Orleans, as follows: Single deliveries of less than 50 gal., consumer tank car plus 2 cents per gallon 50 to 199 gal., consumer tank car plus 1 cent per gallon; 200 gal. and over, consumer tank car plus 0.5 cent per gallon.

Oklahoma and Arkansas

CONTINENTAL OIL CO.

	Gasoline Tank wag.	Inc. tax	Kero. tank wag.
Texarkana, Ark.	14.0	5.5	6.0
Fort Smith	15.5	7.0	6.5
Little Rock	17.25	8.0	8.0
Muskogee, Okla.	15.5	7.0	8.0
Oklahoma City	15.0	7.0	8.0
Tulsa	15.0	7.0	8.0

Tank wagon represents price to consumers. If no dealer price is quoted, the tank-wagon price applies to all classes of trade.

Nebraska

STANDARD OIL CO. OF NEBRASKA

	Gasoline Tank wag.	Dlr.	Inc. tax	Kero. tank wag.
Omaha	17.0	14.4	6.5	9.8
McCook	18.5	15.4	6.5	9.5
Norfolk	18.4	16.9	6.5	10.3
North Platte	18.8	17.3	6.5	10.7
Scottsbluff	18.4	15.5	6.5	10.0

Discounts to commercial consumers for tank-wagon deliveries covered only by standard commercial consumers contract, effective January 1, 1935.

Texas

	Gasoline Tank wag.	Serv. sta.	Inc. tax	Kero. tank wag.
Dallas, Tex.	11.5	15.5	5.5	6.0
Fort Worth	11.5	15.5	5.5	7.0
Houston	12.0	16.0	5.5	8.0
San Antonio	12.5	17.0	5.5	8.0

Naphtha

STANDARD OIL CO. (INDIANA)

	Tank wagon*
Oleum spirits	16.2
V.M.&P. naphtha	16.5
Cleaners' naphtha	15.5
Stanisol	15.5

*Prices include 3-cent Illinois tax but not 1-cent federal tax nor 2 per cent retail occupational tax.

Prices f.o.b. Chicago. Each price subject to discount of 1 cent per gallon for 150-gal. lots if covered by contract.

Canada

3-Star Imperial Gasoline
IMPERIAL OIL, LTD.

	Gasoline Tank wag.	Inc. tax	Kero. tank wag.
Halifax, N. S.	24.5	10.0	18.0
St. John, N. B.	24.5	10.0	18.0
Montreal, Que.	24.0	8.0	16.5
Toronto, Ont.	24.5	8.0	17.0
Hamilton, Ont.	24.5	8.0	17.0
Winnipeg, Man.	27.5	7.0	22.5
Brandon, Man.	28.0	7.0	22.5
Regina, Sask.	25.0	7.0	20.0
Saskatoon, Sask.	20.8	7.0	22.8
Edmonton, Alta.	25.9	7.0	20.0
Calgary, Alta.	23.0	7.0	18.0
Vancouver, B. C.	21.0	7.0	23.0

Tank-Wagon Changes

Standard Oil Co. of Nebraska advanced the consumer tank-wagon and dealer-gasoline prices at several Nebraska points June 17. Tank-wagon prices were advanced 0.5 cent per gallon at Omaha, McCook, and Scottsbluff. A reduction of 0.1 cent per gallon was made at Norfolk. Dealer prices were advanced 0.5 cent per gallon at Omaha, McCook, and Scottsbluff while posting at North Platte was advanced 0.3 cent per gallon. The company reduced kerosene tank-wagon prices 0.5 cent per gallon at Omaha and Scottsbluff. Kerosene was advanced 0.5 cent at McCook and reduced 0.1 cent at Norfolk.

Crude-Oil Price Change

Advances of 20 cents per barrel in eastern crude-oil prices posted June 18 by South Penn Oil Co., Tide Water Associated Oil Co., Pennzoil Co., Quaker State Oil Refining Corp., and other buyers has been met by all buyers in the district. Pure Oil Co. advanced Cabin Creek and Kelly Creek (West Virginia) crudes 20 cents June 18 making the posting there $2.34 per barrel. Ashland

(Continued on Page 139)

PRICES OF REFINED PRODUCTS...

All quotations f.o.b. plant in cars for interstate or export movement except as otherwise noted

Prices as of June 24, 1941
(Most prices in cents per gallon)

The quotations are exclusive of the federal excise taxes of 1 cent a gallon on gasoline and 4 cents a gallon on lubricating oils. Octane ratings in Middle West, Mid-Continent, and Southwest are based on A.S.T.M. method of testing.

Refinery Gasoline

OKLAHOMA (Group 3)—

U. S. Motor grades:		
72-74 octane (regular)	.05875	.06
63-66 octane	.055	.05625
60 octane and below	.05125	.0525
60-62 400 grades:		
72-74 octane (regular)	.05875	.06
63-66 octane	.055	.05625
60 octane and below	.05125	.0525

NORTH TEXAS—

U. S. Motor grades:		
72-74 octane (regular)	.0575	.05875
63-66 octane	.05375	.0550
60 octane and below	.05	.05125
60-62 400	.04875	.0575

NORTH LOUISIANA (Ark. and N. La. delivery)—

U. S. Motor grades:		
72-74 octane (regular)	.0575	.05875
63-66 octane	.05375	.0550
60 octane and below	.04875	.0575

ARKANSAS (Ark. and N. La. del.)—

U. S. Motor grades:		
72-74 octane (regular)	.0575	.05875
60 octane and below	.04875	.05125

CHICAGO (Based on Group 3)—

U. S. Motor grades:		
72-74 octane (regular)	.05875	.06
63-66 octane	.055	.05625
60 octane and below	.05125	.0525
60-62 400 grades:		
72-74 octane (regular)	.05875	.06
63-66 octane	.055	.05625
60 octane and below	.05125	.0525

PENNSYLVANIA (inland refineries)—

74-76 octane (regular)	.0750	.0775
80 octane (1939 Research)	.0775	.0800

CALIFORNIA (domestic movement)—

58-60 400, 65 oct. and higher	.06	.07
54-58 U. S. Motor	.0575	.0625

EAST COAST (domestic)—

U. S. Motor (minimum 72 octane):	
New York (Bayonne)*	.075
Philadelphia	.080
Boston	.080
Baltimore	.082
Charleston, S. C.	.070
	.075

*All grades of gasoline ⅛ to ¼ cent less for barge shipments. New York Harbor prices are for New York and New England delivery. Prices for New Jersey delivery ¼ cent lower.

GULF COAST (domestic)—

U. S. Motor grades:		
80 (research)	.05875	.06
72-74 octane (leaded)	.055	.0575
70-72 octane (unleaded)	.0575	.05875
68-70 octane (unleaded)	.055	.0575

Natural Gasoline

OKLAHOMA (Group 3)—

Grade 26-70	.03375
Grade 18-55	.04

NORTH TEXAS—

Grade 26-70	.03
Grade 18-55	.035

CALIFORNIA—

75-85 375-390	.045	.05

NORTH LOUISIANA (Ark. and N. La. delivery)—

Grade 26-70	.03

Tractor Fuel

OKLAHOMA (Group 3)—

40-42 gr., 315-325 l.b.p., 110-flash, 540-550 e.p.	.03¾	.03⅞
41-43 gr., 300-320 l.b.p., 110-125 flash, 500-520 e.p.	.03⅞	.04
46-48 gr., 210-230 l.b.p., 480 max., e.p.	.04⅛	.04¼

Kerosene

(All kerosene water white)

OKLAHOMA (Group 3)—

42-44	.0450	.0475
41-43	.04375	.04625

NORTH TEXAS—

41-43	.0425	.04625

NORTH LOUISIANA (Ark. and N. La. delivery)—

41-43	.04375	.04625

ARKANSAS (Ark. and N. La. del.)—

41-43	.04375	.04625

PENNSYLVANIA (inland refineries)—

46	.0575	.06125
45	.055	.06

CHICAGO (Based on Group 3)—

42-44	.0450	.0475
41-43	.04375	.04625

CALIFORNIA (Pac. Coast market)—

38-40 high-burning test	.045	.055

NEW YORK (Bayonne, N. J.)—

41-43	.052

GULF COAST (domestic)*—

41-43	.0325	.03375

*Barge price ⅛ cent lower.

Furnace Oil

OKLAHOMA (Group 3)—

Range oil	.04	.0425
No. 1 (white, 38-42)	.03825	.04125
No. 1 straw, 38-40	.0350	.03625
No. 2 straw, 32-36	.0350	.03625
No. 3 zero to 10, 28-32	.03375	.0350

NORTH TEXAS—

No. 1 (white, 38-42)	.0375	.03825
No. 1 straw, 38-40	.03375	.0350

NORTH LOUISIANA (Ark. and N. La. delivery)—

No. 2, 32-36	.0325	.03375

ARKANSAS (Ark. and N. La. del.)—

No. 2, 32-36	.0325	.03375

CHICAGO (Based on Group 3)—

Range oil	.04	.0425
No. 1 (white, 38-42)	.03825	.04125
No. 2 straw, 32-36	.035	.03625
No. 3 zero to 15, 28-32	.03375	.035

NEW YORK (Bayonne, N. J.)—

*No. 1	.052
*No. 2	.049
*No. 3	.049

*Barge deliveries ⅛ to ¼ cent under above tank-car price.

Gas Oil and Fuel Oil

(Gas oil per gal., fuel oil per bbl.)

OKLAHOMA (Group 3)—

No. 5, low pour point, 18-22	.85	.90
No. 6, 15 and above, 8-14	.85	.90

NORTH TEXAS—

No. 5, low pour point, 18-22	.80	.85
No. 6, 15 and above, 8-14	.80	.85

NORTH LOUISIANA (Ark. and N. La. delivery)—

10-14 fuel oil, industrial	.80	.85

CHICAGO (Based on Group 3)—

U.G.I. gas oil	.0325	.035
No. 5, low pour point, 18-22	.85	.90
No. 5, 15 and above, 18-22	.85	.90
No. 6, low pour point, 10-16	.85	.90
No. 6, 15 and above (10-16)	.85	.90

PENNSYLVANIA (inland refineries)—

36-40	.0525	.055

CALIFORNIA—

Los Angeles:		
30-40 gas oil, per bbl.	1.10	1.25
24 plus diesel, per bbl.	1.10	1.25
24 plus diesel (bunkers)	1.20	1.35
12-16 bunkers at tidewater)	.75	.85
10-16 (cargo lots)	.75	.85
12-17 (tank cars)	.65	.75
10-17 (high sulfur)	.55	.65
San Joaquin Valley:		
10-18 (tank cars)	.70	.85
24 plus diesel, per bbl.	1.10	1.25
San Francisco:		
24 plus diesel, per bbl.	1.35	1.40
24 plus diesel (bunkers)	1.40	1.50
10-16 (bunkers)	.80	.85

GULF COAST—

No. 2 fuel	.03⅛	.03¼
43-47 diesel	.03¼	.03⅜
48-52 diesel	.03⅜	.03⅝
53-57 diesel	.03½	.03⅞
58-and-above diesel	.03⅝	.03¾
Diesel bunkers		1.45
Bunker C (bulk cargoes)	.85	.90
Bunker C (bunkers)		.85

NEW YORK (Bayonne, N. J.)—

27 plus, gas oil		.050
28-30 diesel (lighterage 6¼c per. bbl.)		2.00
28-30 diesel (tank cars)	.049	.05
Bunker C (to ocean-going ships in N. Y. Harbor)	1.35	1.50
Industrial fuel (tank cars)		.038

Ligtherage charge 5c bbl. additional.

Bright and Steam Refined

OKLAHOMA (Group 3)—

200-210 D, 10-25	.23
150-160 D, 0-10	.19
150-160 D, 10-25	.185
100-110 D, 0-10	.185
100-110 D, 10-25	.18
Steam refined:	
600 dark green (untreated)	.115

PENNSYLVANIA—

Bright Stocks (Pennsylvania Grade No. 8 color, 140-150 at 210, 545-550 flash):

10 pour point		.245
15 pour point		.235
25 pour point	.22	.23
Steam refined:		
600	.12	.13
650	.12	.14
600 flash	.125	.14
630 flash	.135	.15

Neutral Oil

(Vis. at 100° F. except Pennsylvania and color N.G.A.)

OKLAHOMA (Group 3)—

0-10 pour point:		
150-3		.105
180-3		.11
200-3		.11
250-3		.125
280-3		.135
280-4		.13
300-3½		.145
350-3½		.15
400-3½		.16
500-3½		.165
600-3½		.17
100-2½ paraffin oil 10-25		.06
10-25 pour point:		
200-3		.105
250-3		.12
280-3		.13
280-4		.125

CALIFORNIA (moving to dom. market)—

Pale oils:		
200-2½-3	.07¼	.08
300-2½-3	.07¼	.08
400-3-4	.07¼	.08
450-3-4	.07¼	.08
550-3-4	.09	.11
600-3-4	.09	.11
Red oils:		
200-4-5	.07¼	.08
300-5-6	.07¼	.08
350-5-6	.09¼	.11½
400-5-6	.09¼	.11½
450-5-6	.09¼	.11½
500-5-6	.09¼	.11½
600-5-6½	.09¼	.11½
700-6½ plus	.09¼	.11½
750-6½ plus	.09¼	.11½
900-6½ plus	.09¼	.11½

GULF COAST—

Pale oils:		
100-3	.05¼	.05¾
200-3	.07¼	.07¾
300-3	.07¾	.08¼
500-3½	.08⅛	.09
750-3½	.08¾	.09¼
1,200-3½	.08⅞	.09⅝
2,000-4	.09	.09½
3,000-4		.10¼

PENNSYLVANIA—

150 vis. at 70° F., 3 color, 400-405 flash:		
Zero pour point		.315
10 pour point		.305
15 pour point		.295
25 pour point	.28	.33
200 vis., at 70° F., 3 color:		
Zero pour point		.335
10 pour point		.325
15 pour point		.315
25 pour point	.30	.35

Wax and Petrolatum

(Prices per pound)

OKLAHOMA (Group 3)—

124-126 (A.m.p.) w.c. scale	.03	.03125

PENNSYLVANIA (inland refineries)—

122-124 (A.m.p.) w.c. scale	.0475	.05
124-126 (A.m.p.) w.c. scale	.0475	.05

NEW YORK—

Wax in bags fully refined:		
125-127 (A.m.p.) wax		.0560
128-130 (A.m.p.) wax		.0560
130-132 (A.m.p.) wax		.0585
133-135 (A.m.p.) wax		.0615
135-137 (A.m.p.) wax		.0640
Crude scale:		
124-126 (A.m.p.) w.s.	.0425	.045
124-126 (A.m.p.) y.s.	.040	.0425
Petrolatum in barrels, carload lots:		
Dark green	.02625	.03000
Amber	.02875	.03125
Extra amber	.02500	.02625
Lily white	.04875	.05375
Snow white	.05625	.06375
Cream	.04000	.04375

Export Prices

GASOLINE

GULF COAST—

60-62 400	.05	.06
61-63 390	.055	.0575
64-66 375	.055	.0575

LOS ANGELES—

U. S. Motor grades:		
Above 69 octane	.0575	.06
65-69 octane	.055	.0575
60-65 octane	.0475	.0525

KEROSENE

GULF COAST—

41-43 water white	.03375	.0375

LOS ANGELES—

41-43 water white	.05	.0525

LUBRICANTS

(Pennsylvania Grade)

NEW YORK (f.a.s. in bbl.)—

Cylinder stocks:		
600 S.R. unfiltered	.18	.20
630 S.R. unfiltered	.185	.2025
600 flash, S.R.	.185	.205
650 flash, S.R.	.20	.21
Bright stock:		
Light, 25 pour point	.27	.285

NEUTRAL OIL

200-3 color	.33	.36
150-3 color	.31	.34

PARAFFIN WAX

NEW YORK (prices per lb.)—

123-125 A.m.p.		.0560
125-127 A.m.p.		.0560
128-130 A.m.p.		.0560
133-135 A.m.p.		.0615
135-137 A.m.p.		.0640
Crude scale:		
124-126 w.s.	.0475	.05
124-126 y.s.	.0475	.05

MARKET RECORD OF ACTIVE OIL STOCKS . . .

Compiled by Carl H. Pforzheimer & Co., 25 Broad Street, New York City, Member New York Stock Exchange and New York Curb Exchange

New York Stock Exchange

1941 High	1941 Low	Week ended June 21 High	Low	Close	Stocks—	Total shares outstanding	Par value	Latest dividend	Payable or last paid	Dividends paid in 1940	Com. sh. earn. 1940	Com. sh. earn. 1939	1940 High	1940 Low	1939 High	1939 Low
58⅞	43	58⅞	58	58½	Amerada Corp.	788,675	N.P.	50cQ	4-30-41	$2.00	$2.25	$1.56	58½	38½	74½	50
24¼	19½	20⅞	20	20	Atlantic Refining	2,663,999	$25	25cQ	6-16-41	1.00	2.11	1.66	27⅛	18¼	24⅝	18⅛
10½	7	8⅞	8¼	8½	Barber Asphalt Co.	390,223	$10	25c	5-21-40	.50	—.48	1.39	16⅝	8½	21	10¼
9⅞	7⅝	9¼	9	9	Barnsdall Oil Co.	2,558,779	$5	15c	6-9-41	.60	.97	.76	13⅜	7⅛	19½	11⅛
6½	5¼	6	5⅝	5⅞	Consolidated Oil Corp.	13,751,726	N.P.	12½cQ	8-15-41	.72½	.28	.55	8⅛	5½	9⅞	6½
22⅞	17⅜	22⅞	22¼	22⅜	Continental Oil of Delaware	4,682,572	$5	25cQ	6-30-41	1.00	.92	1.35	25	16⅜	31½	19⅞
4¾	3½	4¼	4	4⅛	Houston Oil	1,098,618	$25	....	10-17-30	....	.30	.43	6⅞	3⅜	9⅜	4½
12	9⅝	12	11¾	11¾	Lion Oil Refining	435,815	N.P.	25cQ	4-15-41	1.00	1.05	1.50	14⅜	9	18⅛	10
17¼	13	16¾	16½	16½	Mid-Continent Petroleum	1,857,912	$10	40c	6-21-41	.80	1.60	1.42	17⅝	11½	18	11⅛
11¾	9⅜	11	10¾	10¾	Mission Corporation	1,378,645	$10	25c	12-20-40	.25	1.01	.87	11¾	7⅛	14⅞	8¾
6⅞	4¼	6⅞	6	6½	National Supply	1,155,517	$10	....	12-22-37	....	—.49	—.87	9¾	4⅝	15½	5⅝
9½	6¾	9¼	8⅞	9	Ohio Oil Co.	6,563,377	N.P.	25c	6-14-41	....	1.02	—.10	8¾	5⅜	10¼	6
8	5½	6⅞	6½	6¾	Pacific Western Oil	1,000,000	N.P.	40c	12-19-39	....	—.21	.81	8⅞	5½	11⅞	7
10⅝	7¼	..	..	..	Pan American Pet. Trans.	4,702,945	$5	25c	12-21-40	.25	1.20	1.10	10½	6¾	8⅜	5
44⅜	35¾	44⅜	42¾	43½	Phillips Petroleum	4,449,052	N.P.	50cQ	5-31-41	2.00	2.60	2.21	41¾	27⅛	46½	31¼
16⅞	14¼	16	15¾	15⅝	Plymouth Oil Co.	1,038,633	$5	30c	6-30-41	‡1.30	1.38	2.38	22¾	15	24	17⅛
10	7	9⅞	9¼	9½	Pure Oil Co.	3,982,031	N.P.	25c	12-20-40	.25	1.21	1.11	11½	6¾	11⅜	6⅛
9	7¼	8¼	8	8	Richfield Oil Corp.	4,010,000	N.P.	50c	12-21-40	.50	.95	.65	9¼	5⅞	10¼	6⅝
15⅞	12½	15½	15½	15½	Seaboard Oil of Delaware	1,244,383	N.P.	25cQ	6-14-41	1.00	1.05	1.40	20	11	24⅜	15½
15	10⅛	14⅜	13¾	14⅜	Shell Union Oil	13,070,625	N.P.	50c	12-20-40	.75	1.05	.77	13⅛	7⅝	17¼	9⅞
28¾	18⅞	28⅜	27¾	28⅜	Skelly Oil	995,349	$15	50c	12-20-40	1.25	3.28	1.99	23¼	12¼	29½	15½
9⅞	8¼	9	8⅝	8¾	Socony-Vacuum	31,206,071	$15	25cSA	3-15-41	.50	1.17	1.10	12½	7⅛	15⅛	10¼
23½	17⅞	21⅝	20	20½	Standard Oil of California	13,003,953	N.P.	25cQ	6-16-41	1.00	1.73	1.38	26⅛	16¼	33⅝	24¼
31	25½	30½	29¾	30	Standard Oil (Indiana)	15,272,020	$25	25c	6-16-41	1.50	2.20	2.23	29	20¾	30	33¾
39⅝	33	39¾	38⅝	39⅛	Standard Oil of New Jersey	27,280,998	$25	1.00†	6-16-41	1.75	4.54	3.26	46½	29⅞	53½	38
42½	34¼	42½	41¾	42	Standard Oil of Ohio	753,740	$25	37½c	6-14-41	2.00	7.44	6.64	41¾	26¼	32¾	17
58¾	50	54	53½	53½	Sun Oil	2,434,863	N.P.	25cQ	6-16-41	*1.00	3.03	2.74	65⅞	46¾	66	45¾
2¼	1⅜	2⅛	2	2	Superior Oil Corp.	1,388,979	$1	10c	12-28-40	.10	.11	.04	2½	1⅛	3⅝	1¾
40¾	34½	40⅛	39	39	Texas Corp.	10,876,139	$25	50cQ	7-1-41	2.00	2.90	3.02	47⅝	33	50¾	32½
4⅛	2⅞	3¾	3½	3½	Texas Gulf Producing Co.	888,147	N.P.	10c	6-14-41	.20	.63	.69	4¼	2½	5⅝	3¼
6¾	5¼	6¼	6¼	6¼	Texas Pacific Coal & Oil	888,236	$10	10c	6-2-41	.40	.54	1.00	8⅝	5⅜	11⅜	7
10⅝	9⅜	10¼	10	10	Tide Water Associated	6,371,827	$10	15c	6-2-41	.70	1.14	1.05	12	8¾	14¼	9½
14¾	12¾	14	13⅝	13¾	Union Oil Co. of California	4,666,270	$25	25c	5-10-41	1.00	.99	1.25	17½	12	19¾	15⅛
30⅞	25⅝	30¼	30	30¼	Union Tank Car Co.	1,177,381	N.P.	50c	6-2-41	1.75	2.22	2.07	29⅞	22¾	24¼	20⅛
2⅜	1⅝	2	2	2	Wilcox Oil & Gas	470,768	$5	10c	2-15-40	....	.35	.77	3⅝	1¾	4¼	2⅜

*Also 5 per cent in stock. †Includes extras. ‡Also 2 per cent in stock. —Deficit.

New York Curb Exchange

1941 High	1941 Low	Week ended June 21 High	Low	Close	Stocks—	Total shares outstanding	Par value	Latest dividend	Payable or last paid	Dividends paid in 1940	Com. sh. earn. 1940	Com. sh. earn. 1939	1940 High	1940 Low	1939 High	1939 Low
¾	¼	⅝	½	½	American Maracaibo Co.	1,778,415	$1	....	.....	....	—$0.05	—$0.04	1⅛	¼	1¼	½
7⅝	5⅛	7⅝	7⅛	7¼	American Republics Corp.	1,308,049	$10	25c	12-18-40	....	.78	.14	10¾	4½	11⅜	5½
1⅜	1	1½	1½	1½	Bridgeport Machine Co.	263,700	N.P.	$1.25	12-30-37	....	—.88	—.95	3¼	1⅜	7¼	2½
42½	36½	41½	41½	41½	Buckeye Pipe Line Co.	200,000	$50	$1	6-14-41	$4.00	5.09	3.13	43	28	34⅝	26½
110¼	87	88⅝	88½	88⅝	Chesebrough Mfg. Co.	120,000	$25	$1.50Q†	6-23-41	6.00	6.33	7.87	117	95	130	108⅝
5⅛	3¾	4	3⅞	4	Cities Service (new)	3,703,978	$10	....	6-1-32	....	1.72	.68	6¾	4	9¼	4¼
1½	¾	1¼	1⅛	1¼	Cosden Petroleum	465,332	$1	....	.....	....	....	....	2⅛	⅝	2¼	½
17¼	12½	16⅛	15¾	15⅞	Creole Petroleum	6,974,356	$5	50cSA†	6-16-41	1.00	.98	1.38	24¼	11⅝	28	16¾
7¼	3¾	..	..	..	Darby Petroleum	351,390	$5	25c	7-15-41	....	1.12	.03	4⅜	2⅞	7⅛	3⅝
1¾	1	1¾	1⅝	1⅝	Derby Oil & Refining	263,162	N.P.	....	.....	....	.12	—.37	2	¾	2⅝	1½
28¾	21¼	22½	22½	22½	Eureka Pipe Line	50,000	$50	50c	5-1-41	2.25	—.49	.63	31	20¼	23	15⅛
35½	29	34⅞	34	34	Gulf Oil Corp.	9,076,202	$25	25cQ	7-1-41	1.25	2.44	1.69	39⅞	25⅛	45⅛	29¼
63	52¾	60	58¾	59	Humble Oil & Refining	8,987,840	N.P.	37½c	7-1-41	2.00	3.13	3.33	68	47⅛	71	42½
7	5¾	6⅜	6¼	6⅜	Imperial Oil of Canada	26,965,078	N.P.	25c	6-2-41	.62½	.65	.71	12⅜	5⅜	17	11⅜
5	2¾	5	4¾	4¾	Indiana Pipe Line	300,000	$7.50	20c	11-15-40	*2.80	.09	.33	7¾	3	7¼	5½
11	8⅞	9⅝	9¼	9½	International Petroleum	14,324,088	N.P.	50c	6-2-41	1.25	....	1.19	10⅜	8¼	27½	17
2⅝	1⅜	2	2	2	Kirby Petroleum Co.	500,000	$1	10c	3-15-41	....	.16	.06	2¾	1⅝	3¾	2⅛
10⅛	8½	9	8¾	8¾	Lone Star Gas	5,518,347	N.P.	20c	4-22-41	.70	1.17	.98	10¾	7⅝	10½	7⅛
5⅜	4⅛	5	4⅝	4⅝	Louisiana Land & Exp.	2,966,762	$1	10c	6-16-41	.35	.29	.22	6¼	3¾	7¾	4
10	9½	..	..	..	Margay Oil Corp.	149,943	N.P.	25cQ	4-10-41	1.00	1.02	1.52	17	9¼	17	14½
8	7	7¼	7⅛	7⅛	Midwest Oil Co.	998,474	$10	45c	6-16-41	.90	.88	.99	8½	5½	8¾	6⅝
6⅛	5⅛	5½	5¼	5½	Mountain Producers	1,593,584	$10	30cSA	6-16-41	.60	.58	.70	6¼	4⅞	6	4⅞
12⅜	10⅛	11⅛	11	11	National Fuel Gas	3,810,183	N.P.	25cQ	4-15-41	1.00	1.12	.95	13⅛	10	14	11¼
12¾	10¼	12	11¾	12	National Transit	509,000	$12.50	50c	6-16-41	1.00	1.08	.91	12½	8¾	9½	7¼
1¼	1	1	1	1	New Mexico and Arizona	1,000,000	$1	1c	12-1-37	....	.03	.02	1¼	⅝	1⅝	1
8	6⅝	..	..	..	New York Transit	100,000	$5	30c	4-15-41	.60	.91	.88	7¾	5¼	6	4
9¾	8	9½	9½	9½	Northern Pipe Line	120,000	$10	50c	6-2-41	.80	.70	.31	9⅞	6	7	4½
3⅞	2⅝	3⅞	3⅝	3⅝	Pantepec Oil	2,856,872	$1	....	.....	....	....	....	5½	2½	7⅝	4
2¼	1	2⅞	2⅜	2⅜	Root Petroleum Co.	336,045	$1	25c	2-1-37	....	.04	.70	3¼	1	5	1¼
2⅝	2⅛	..	..	..	Ryan Consolidated	298,931	N.P.	10c	12-28-40	....	.43	.16	3	1¼	3	1⅞
8	6½	7⅜	7⅜	7⅜	Southern Pipe Line	100,000	$10	25c	3-3-41	.50	.81	.25	11¾	4¾	4⅞	3½
39¾	36⅛	38	37⅞	38	South Penn Oil	1,000,000	$25	37½c	6-27-41	2.50	2.10	2.84	44	28	40½	26¾
30½	23	..	..	..	Southwest Penna. Pipe Lines	35,000	$50	50c	7-1-41	6.50	3.22	2.06	35	21	23	18
20¾	17⅞	19	18¾	18⅞	Standard Oil of Kentucky	2,604,790	$10	25c	6-16-41	1.30	1.47	1.53	20⅞	16½	20⅛	17¼
2	1⅜	2	1⅝	2	Sunray Oil	1,975,876	$1	5c	12-20-40	.10	.23	.25	2	1⅜	2⅜	1⅜
3¼	2⅜	2¾	2¾	2¾	Texon Oil & Land	936,024	$2	10c	6-28-41	.40	.45	.49	3⅛	2	4	2⅝
3⅜	2¼	3⅜	3⅜	3¾	Transwestern Oil Co.	750,000	$10	....	.....	....	—.59	—1.42	3⅜	2	6	2½
1/16	½	1/16	½	⅛	United Gas Corp.	7,818,959	$1	....	.....	....	—.49	—.55	2⅛	⅜	3⅝	1½

*Includes $2.50 capital distribution. †Includes extras. —Deficit.

EQUIPMENT PROGRESS...

Brewster Introduces New Combination Hook-Block

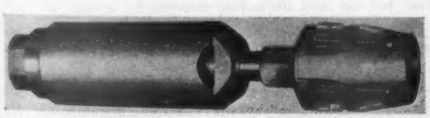
To overcome the lack of derrick space usually encountered in most portable rigs, the Brewster Co., Inc., Shreveport, La., has designed and developed this short-coupled combination hook-block. This new streamlined piece of equipment is identified as Model H-50-B.

The H-50-B block incorporates three manganese-steel sheaves 22 in. in diameter. A two-piece cover streamlines the block and enables all pins and bolt heads to be countersunk. Line guide around sheaves reduces rigging time to a minimum and makes it unnecessary to remove the guard covers when stringing the block. Side sway is reduced by mounting sheaves on tapered bottom pins 1¾ in. diameter. Hook is spring-loaded type with 4-in. travel, forged from manganese-chrome-moly steel and swivels on roller thrust bearings. A locking device holds the hook firmly in either of four positions. Over-all length only 68 in., width 23 in.,, depth 14 in. Maximum safe load capacity 100,000 lb. Approximate weight 1,500 lb.

New Double Ball-Thrust Motor Speeds Refinery Tube Cleaning

When self-feeding cutter heads were introduced some years ago, they were immediately accepted as a forward step in refinery tube cleaning. They speeded up cleaning because the cleaner pulled itself into the tube and relieved the operator of considerable work.

The pull of the self-feeding cutter head, however, puts considerable thrust on the front end of the rotor



Elliott (Lagonda type) double ball-thrust motor with Type UO cutting head

of a tube-cleaner motor; likewise, pushing the cleaner through the tubes in heavy coke puts a thrust on the rear end of the rotor. These forces mean friction and wasted power. To correct this situation, engineers of the Elliott Co., Jeannette, Pa., have developed a double ball-thrust motor which very effectively eliminates friction due to thrust in both directions. In thus reducing friction, the motor develops more effective power.

In operation, the new Elliott 1100 Series motor shows its increased effective power. It has reserve power, which gives the ability to maintain its speed under all coke conditions. There is no waste of power due to thrust. The sound of the motor in operation in the tube tells the story.

This new motor has high torque to maintain speed for cleaning heavy coke, as well as the necessary high speed for the cleaning of thin, hard coke. There is no increase in air consumption. The increase in effective power is due only to the minimizing of friction and the elimination of wasted power.

The motor has a free exhaust which results in minimum back pressure. It is built throughout of the very best materials and has the benefit of the very latest and best heat-treating methods as well as experienced and skilled tube cleaner craftsmanship. Maintenance of these double ball-thrust motors is negligible. The Elliott 1100 Series motor is made in a complete range of sizes for straight tubes. Any type of cutter head can be used with it.

Equipment Developed by Abrams Aids Aerial Photography

Three years ago the Abrams Air Craft Corp. was formed as a branch of the Abrams Aerial Survey Corp., Lansing, Mich., to perfect a high-altitude mapping plane. The result was the Abrams "Explorer," a pusher-type plane with glass-enclosed, hermetically sealed gondola to insure visibility in all directions. The unique "mapper" was designed to operate at 30,000 ft. so as to enable the photographer to take in greater sections per exposure.

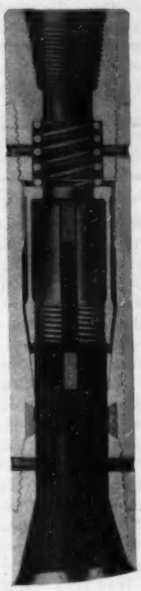
This was only part of the answer as there was need of an improved aerial camera. The C-3 topographic was the result, produced by the Abrams Instrument Co. This product could be taken up to 30,000 ft., and with its 500-ft. roll, used there all day over the oil fields and pipe-line country.

However, the picture was still incomplete. Thus an instrument was developed that would enable the geologist and oil engineer to interpret the aerial photograph. This was the Abrams contour finder, a compact instrument involving use of two stereoscopic aerial photographs with known control points.

Use of the contour finder for oil engineering research is being facilitated by new, large-scale aerial photographs on a scale of 100 ft. to the inch. Smaller-scale maps are sufficient for pipe-line survey work, on a 1-in.-to-1,000-ft. basis. For a close study of distribution lines and projected distribution line sites within a community, 1 in. to 400 ft. is a scale suggested by the aerial surveyors. Power transmission lines for gas companies could be inspected similarly.

Houston Engineers Makes Design Changes in "H-E" Overshot

Houston Engineers, Inc., Houston, Tex., has announced several mechanical changes in the design of the "H-E" overshot. According to the manufacturer, the "H-E" overshot, which has already been established as one of the most efficient fishing tools available to the industry, now embodies the following three important new features: (1) It is equipped with the reliable "Bowen" packoff rubber; (2) it contains a special provision to positively place the slips in either catching or releasing position during fishing operations without removing the overshot from the hole; (3) wide, coarse, shallow threads are employed for both the body and guide to permit faster makeup and to eliminate crossthreading.

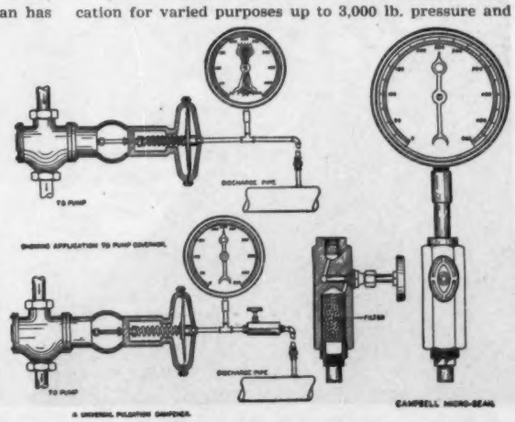


Other special and original features of the "H-E" overshot include: Two methods of releasing; rotating fish in either direction with strain; no amount of jarring within its capacity can affect its releasing mechanism; carburized slips of one-piece design; interchangeable slips to catch any diameter fish up to the bore size of the overshot; a slip stop which positively prevents the slip from being pulled past the taper in the bowl; minimum outside diameter; a full opening through the entire tool to provide ample clearance for an inside cutter or shot; and a single-unit assembly which is set-screwed in place to prevent accidental unscrewing while in operation.

Additional information pertaining to the design of the "H-E" overshot, together with prices and parts list, will gladly be furnished by the manufacturer.

MICRO-ACTION VALVE FOR GOVERNORS AND GAGES

For dampening the pulsation of boiler-plant pump governors and to eliminate "jitters" of the gage hand, a novel device known as the Campbell Micro-Bean has been developed. It can be installed on the pressure line to the diaphragm of a pump governor for protection of the pressure gage mechanism and tube, also the spring, diaphragm and stem packing. It is also effective as protection to any control valve, such as a back pressure or reducing regulator and for use with sensitive control instruments subjected to pulsating flow. The valve will handle steam, fuel oil, gas, water or other liquids, with simple adjustment for each viscosity.



The Micro-Bean consists of a solid brass body in which a filter is inserted for protection from foreign matter. The valve has an extremely slight taper so that very sensitive control of the shut-off is effected. This slight taper minimizes the tendency to pinch off, under changing pressure conditions, to approximately 2 per cent of what is usual in an ordinary valve, according to the inventor. The micrometric control of the opening enables the operator to obtain the closest approach to full shut off down to the last 0.003 in., regardless of the line content.

In the Micro-Bean the solid metal body is said to minimize the effect of body strain. A 48-to-1 taper of the valve minimizes the effect of steam and screw compression strain. The device is universal in application for varied purposes up to 3,000 lb. pressure and will give any degree of stabilization desired by merely turning the valve. Any scoring which might eventually take place, (it is microscopic) can be simply ground out by shutting off the valve completely two or three times. The device is manufactured by J. A. Campbell Co., 645 East Wardlow Road, Long Beach, Calif.

New Line of Journal Bearings Carried by Jeffrey Company

A new and improved line of solid and split journal bearings, carried in stock and neatly cased and labeled for prompt delivery, is announced by the Jeffrey Manufacturing Co., Columbus, Ohio. Of accurate dimensions with modern rounded lines and smooth gunmetal finish, these precision-made bearings have machined bases and faced ends. Height to center line of shaft is rigidly maintained. The babbitted bores are broached to smooth hard surface and require no "wearing in."

Both styles are tapped for grease cups or pressure fittings. An ample storage groove in the top provides proper distribution of lubricant. In addition, the split bearings has feeder grooves on each side. Individual containers are furnished for easy handling and protection in shipping.

TRADE LITERATURE

DUFF-NORTON MANUFACTURING CO., Pittsburgh, Pa.—Catalog 200, a newly revised data book on industrial jacks, containing 64 pages of useful reference material, and listing equipment for every type of lifting, lowering, pushing and pulling application. Specifications are given on the complete Duff-Norton line of over 300 types and sizes of jacks. Details of operation of the Duff-Norton improved single unit automatic mechanism are described and illustrated.

MERCO NORDSTROM VALVE CO., 400 Lexington Avenue, Pittsburgh, Pa.—Bulletin V-135, presenting various port and stop arrangements provided by Multiport valves. Ground plans are shown of the arrangements effected by three-way, two-port; three-way, three-port, and four-way, four-port valves at various degrees of turn, 90°, 180°, and 270°. Illustrations of the different types of Nordstrom Multiport valves are shown, with specification tables. Sizes range from ½-in. to 16-in. for pressures tested to 3,000 lb.

HAZARD WIRE ROPE DIVISION, American Chain & Cable Co., Inc., Wilkes-Barre, Pa.—24-page comprehensive booklet on the safe use of wire rope. Not only does this new booklet give tables of breaking strengths for all commonly used rope constructions, together with safety factors for the principal rope applications, but it offers constructive information on the effects of acceleration, the various constructions and grades of wire rope, and suggestions for the correction of operating factors effecting safety such as abrasion, bending fatigue, reverse bends, kinking, spooling, crushing and corrosion. In addition, the booklet tells when to discard (and also how to correct) wire rope with broken and porcupined outer wires; how properly to lubricate rope; how to apply attachments and how properly to inspect wire rope. It gives tables for the safe sizes of sheaves and drums, and how to calculate safe groove diameters.

BUDA CO., Harvey, Ill.—Bulletin 1019, dealing with Buda-Hubron earth drills for pole-line construction, foundation work, geophysical work and many other operations. Descriptions of the various types are given, along with their recommended uses.

NATURAL-GAS EQUIPMENT, INC., 539 Petroleum Building, Los Angeles, Calif. — Catalog 300, 19-page booklet describing N.G.E. gas burners for commercial and industrial gas-fired applications. Features and capacities of the various types of burners are listed.

BETHLEHEM STEEL CO., Bethlehem, Pa.—Catalog 156, a 32-page booklet featuring its new low-alloy, high-strength steel "Mayari R" having exceptional workability, excellent welding qualities, uniform properties and increased corrosion resistance. Physical properties of the steel and its wide application in industry are given.

S. F. BROWSER & CO., INC., Fort Wayne, Ind.—Folder describing a new automatic temperature compensating meter for measuring liquids, the Xacto meter, that automatically adjusts itself when the temperature changes so that the number of gallons shown on the dial is a true reading of gallons at 60° F.

PENN ELECTRIC SWITCH CO., Goshen, Ind.—Bulletin E-100, a 12-page catalog describing safety-control equipment for oil, gas and gasoline engines. Included are diagrams of oil pressure safety controls, water or bearing temperature safety controls, combination oil pressure and water or bearing temperature safety controls, and solenoid fuel line shut-off valves.

CUMMINS ENGINE CO., Columbus, Ind.—Bulletin 5182, describing its line of heavy-duty industrial diesel engines; Bulletin 5179, describing its diesels for trucks. Various models are described, torque curves shown and complete specifications given.

DEHYDRO SALES MEETING TAKES FORM OF PROGRAM QUIZ

Designed to stimulate the exchange of knowledge on oil-treating problems the Dehydro Co. adopted the "questions and answers" idea in conducting its semi-annual sales and service meeting at the Mayo Hotel in Tulsa, June 6 and 7. Representatives of this growing organization were assembled from the Mid-Continent and eastern fields to participate in the program. A greeting of welcome was extended to each by H. L. Berkey, manager, and H. S. Horton, sales manager.

Definite progress in the understanding of the practical field problems and their solutions resulted from the enthusiasm manifested in the meeting. The seriousness of the meeting was broken by Mr. Berkey's awarding service pins to many of the men. Present at the meeting, in addition to the executives mentioned, were: Orval Humphrey, LeRoy Horton, Ira W. Lind, Howard W. Andrews, Arlin A. Beavers, William T. Roach, Lester L. Hunter, J. C. Nicholson, Dale Shappell, B. C. Flynn, Duncan Marquiess, Aaron Ratliff, Mark Bolles, E. E. Lewis, Ralph Bussett, W. M. Best, Russell C. Anduss, W. A. Preston, Claud C. Best, Murl R. Ogden.

New Self-Orienting Tool for Hole Straightening and Deflecting

A new type of full-gage deflecting tool, which is self-orienting and is run into the hole without the use of orienting clamps or surveying instruments, is being marketed by the Eastman Oil Well Survey Co. of Dallas, Tex., and Long Beach, Calif. Known as the Driftmaster, the new tool is used for hole straightening, controlled directional drilling, and sidetracking cement plugs. Features claimed for the Driftmaster are that it automatically orients itself on the bottom to the low side of the hole and can be pointed to drill in any desired direction. The only survey operation necessary before running the Driftmaster is that a drift indicator or a single-shot reading be taken. The tool is then run on the drill pipe in the same manner as running the ordinary bit. The use of orienting equipment is not required, nor does the hole have to be ratholed or reamed.

The Driftmaster embodies some of the features of the well-known knuckle-joint type of deflecting tool and includes in addition the self-orienting mechanism. This, through eliminating the need for orientation while running in and subsequent checking with surveying instruments, saves time and avoids drilling delays. In operation, the Driftmaster is made up on a limber joint of drill pipe, the operating parts are lubricated, and the tool is lowered into the hole in the same manner as though it were a bit. Bridges or obstructions which may be encountered above bottom can be drilled out without affecting the subsequent self-orientation of the tool.

In hole-straightening operations, a record of the angle of inclination only is necessary because of the fact that the tool automatically cocks toward the low side of the hole. Therefore, when it is set down again to commence drilling the course of the hole is reversed. After 10 to 20 ft. of hole is made, a drift indicator may be run through the drill pipe down to the tool to check the angle of the new hole before the Driftmaster is withdrawn. For directional drilling, the low side of the hole is determined through the single-shot reading taken before the tool is run; it is only necessary to turn the drill pipe the desired distance away from the known low side of the hole to the proper direction for the new deflection course.

Bits used on the "stinger" may be either the diamond-point type or a rotary-shoe type. The Driftmaster has been used extensively in Gulf Coast fields where it has proved to be the quickest and simplest device yet produced by the Eastman organization for drilling full-gage deflected holes. Further information may be obtained from the offices of the Eastman company, Box 5298, Dallas, and 2893 Long Beach Boulevard, Long Beach.

Thermoid Offers Complete Line Of V-Sheaves and Pulleys

Thermoid Rubber, Division of Thermoid Co., Trenton, N. J., announces an important addition to its industrial rubber products program. In addition to the lines of V-belts—both multiple and fractional horsepower—which Thermoid has been selling for the past 3 years, the company is now offering a complete line of V-sheaves and pulleys. This addition makes it possible for Thermoid distributors to offer complete V-belt-drive service and equips them to engineer and install V-belt drives from ¼ hp. to 1,000 hp.

Complete information on Thermoid V-belt drives is contained in a simplified, easy-to-use 80-page engineering manual which covers Thermoid multiple and fractional horsepower V-belts and drives. The addition of

V-belt drives makes the Thermoid industrial rubber products line one of the most complete in the industry including all types of transmission belting, conveyor and elevator belting, wrapped and molded hose, packings, industrial brake linings, rubber-covered rolls, and pulley lagging.

Eastern Announces New Midget Positive-Pressure Pump

The Eastern Engineering Co. has announced the addition of a new model to its line of midget-size pumps, the Model UT midget positive-pressure pump. Main features of the pump are its self priming, compactness and operation at high pressures. It is a rotary-type pump, 6 by 3 by 2½ in. in size, weighing 3½ lb., and has a maximum pressure of 35 lb. per sq. in. and a maximum volume of 3 g.p.m. It is driven by a 1/20-hp., 115-volt, a.c. or d.c. motor, the motor armature and pump impeller being mounted on a single shaft making coupling unnecessary.

This pump is ideal for any application in which the location of tanks and containers make the self-priming features essential. Its light weight and small size make it particularly adaptable to all installations requiring the pumping of thin liquids where weight and space involved must be kept at a minimum.

AMONG EQUIPMENT MEN...

Eiche Sends T. G. Martin On South American Trip

R. J. (Bob) Eiche, well-known export representative, has sent his engineer, T. G. Martin, on an extended trip to South America, in the interest of the various oil-well manufacturing companies which R. J. Eiche represents. Mr. Martin left for Venezuela, the starting point of his trip, and will proceed from there on a complete circuit of South American oil-producing areas. Having many years' experience as an engineer in both drilling and producing practices, Mr. Martin is well equipped to explain and discuss the applications of the equipment he represents.

R. J. EICHE

R. J. Eiche directs the export sales work of the following manufacturers: The Cavins Co., Chiksan Tool Co., Crum-Brainard Co., Ltd., Eason-Theroif Tool Co., Eastman Oil Well Survey Corp., Hamer Oil Tool Co., Hopper Machine Works, Inc., Specialty Oil Tool Co., Tru-Line Corp., Web Wilson Oil Tools, and Well Equipment Manufacturing Corp.

J. R. Spence Made General Sales Manager of Stoody

J. R. (Jack) Spence has recently been appointed general sales manager of Stoody Co., Whittier, Calif. Mr. Spence has been active in the hard-facing industry for many years and is not only responsible for the development of several hard-facing alloys, but has also been instrumental in determining correct procedures for hard-facing many types of industrial equipment. Mr. Spence has been with Stoody Co. more than 6 years, serving first as chief metallurgist and later as industrial sales and research manager.

BUSINESS NOTES

E. S. Bissell has been made vice president of the Mixing Equipment Co., Inc., of Rochester, N. Y., by action of the board of directors of that company in May 1941. Prior to his promotion, Mr. Bissell was technical sales manager of the company, makers of "Lightnin" mixers.

M. B. (Jack) Johnson, effective June 1, was appointed manager of the Tulsa district of the Perdue Tank Co., Wichita, Kans., manufacturers of regular, gastight and vapor-pressure wood tanks and also distributors for Columbian steel tanks. Previous to becoming district manager for the Perdue company, Mr. Johnson for 12 years was with American Tank Co. and Black, Sivalls & Bryson, Inc., and for 4 years with Bethlehem Supply Co.

Wesley Fisher Appointed Sales Representative for Briggs

Announcement has been made of the appointment of Wesley Fisher as sales representative of the Briggs Clarifier Co. to work with the Continental Supply Co., exclusive oil-industry distributor of Briggs oil-clarifying and filtering equipment.

Mr. Fisher takes up his new position with 12 years of industrial-refining experience behind him, in which special attention was given to lubricating problems. His office will be located at Houston, Tex., but he will travel extensively throughout the territory served by Continental Supply Co.

E. W. Gard Joins Staff of Bechel-McCone-Parsons

Announcement of the appointment, effective June 14, of Earle W. Gard, former manager of research and development of the Union Oil Co., to the staff of Bechel-McCone-Parsons Corp. of Los Angeles, Calif., has been made by John A. McCone, president of that organization. The appointment is a very important addition to the company's staff of experienced men required to keep pace with the rapidly widening scope of the organization's activities in serving the technical need of the oil industry, Mr. McCone said.

EARLE W. GARD

With the exception of a period from 1923 to 1928, when he was assistant engineer and refinery manager for Pan American-Western Petroleum Co., Mr. Gard has held executive engineering positions with the Union Oil Co. since 1919, and was in charge of development engineering, design, construction, and operation of new processing plants, research, patent, and economic surveys.

Mr. Gard will bring a background of wide experience to the Los Angeles engineering concern. A native of Ohio, he graduated from U.S.C. in 1917 with degrees in electrical and chemical engineering. He joined the Union company at Los Angeles in 1919, being assigned to process and development work. After an interlude with Doheny's Pan American, during which he was assistant construction engineer and refinery manager of the Watson plant—now the Richfield Wilmington refinery—he rejoined the Union Oil Co. as assistant to the late R. E. Haylett, director of manufacturing.

In 1933 he was put in charge of development engineering design, construction, and operation of new processes. In 1938 he became manager of research and development, which position he held up to his resignation from the oil company this month. He is a member of the A.P.I., S.A.E., A.S.M.E., A.C.S., and University Club of Los Angeles.

Michigan Fields

(Continued from Page 126)

ship fields scored pronounced increases in production, Winterfield gaining 1,150 bbl. a day, but development in those sections was insufficient to offset a 662-bbl. daily average drop in Allegan County fields, a 900-bbl. decline in the daily output of the Walker-Wyoming-Tallmadge district and a 600-bbl. drop in Clare's Freeman-Redding section, which, however, continued to hold first place in production figures.

Southerly Development of Winterfield Halted by Dry Hole

Prospects for southerly development of the Winterfield pool were lessened because of failure of Chapman Oil Co. 1 State-Winterfield in Section 35. The hole filled with Dundee water after making a small show of oil at 3,816 ft. Because of that failure, Chapman abandoned location for an offset. Meanwhile Sun Oil Co. B-1 State, ¼ mile west of the failure, was under test. Several hundred feet of oil was in the hole and drillers planned to acidize. In Redding, Section 29, American Drilling Co. X-3 State was acid-completed for 125 bbl. a day.

Two New Berea Producers Expected in Monitor Township

Two small new Berea producers were indicated for Monitor Township. Both in Section 3, Chapman Oil B-2 Schultz was prepared for nitro shot while United Drillers 4 Kircher was testing. Meanwhile a recementing job temporarily delayed progress on Gulf Refining Co. 1 Bateson deep test. Drilling around 8,300 ft. was due to be resumed this week.

Meantime, 10 counties shared in the 15 drilling permits issued by the state Conservation Department during the week. Three are for Allegan locations, two for Isabella, two for Clare, two for Van Buren, one each for Ottawa, Oceana, Huron, Kent, Missaukee and Osceola.

Surplus Gas Being Stored Underground at Austin

L. & S. Drilling Co. has spudded its third gas test in this new Isabella County gas field and has arranged for five more tests with rotary equipment. Meanwhile in Montcalm County, Taggart Bros. 1 Maltritz wildcat was abandoned at 1,175 ft.

Some Michigan surplus natural-gas production now is being stored for winter requirements. To avoid premature abandonment of Austin Township wells in Mecosta County, surplus from Clare's Lincoln Township is being piped and stored underground. Plans also are under way to pipe and store gas from other parts of the state.

MICHIGAN COMPLETIONS

Allegan County

Casco Township: Alfred R. Urion 2 Voss, NW SW SW 27-1n-16w, dry, T.D. 1,124 ft.
Trowbridge Township: Rex Oil & Gas 1 Dickinson, C S½ S½ SW 31-1n-13w, dry, T.D. 1,330 ft.

Arenac County

Adams Township: United Drillers & Producers 3 Klein, SE SE SE 23-19n-3e, 64 bbl., acid, T.D. 2,982 ft.

Clare County

Redding Township: American Drilling Co. X-3 State, C N½ NE SW 29-19n-6w, 125 bbl., acid, T.D. 3,849 ft.
Winterfield Township: Chapman Oil Co. 1 State-Winterfield, C N½ SE SE 35-20n-6w, dry, T.D. 3,816 ft.
Chapman Oil Co. 2 State-Winterfield, C S½ SE SE, location abandoned.

Montcalm County

Reynolds Township: Taggart Bros. Co. 1 Maltritz, C SW 10-12n-10w, dry, T.D. 1,175 ft.

Ottawa County

Holland Township: Southwest Development 1 Riemersma, NW NW NW 25-5n-15w, dry, T.D. 1,490 ft.
Jamestown Township: Fisher-McCall Oil & Gas 1 Beiber, SE NE NE 36-5n-3w, dry, T.D. 1,731 ft.
Tallmadge Township: Bridger-Basin Oil Corp. 1 Moelker-Tanis, SE SE SW 1-6n-13w, 20 bbl., acid, T.D. 1,887 ft.

Van Buren County

Bloomingdale Township: Jetter Drilling Co. 5 Hinse, NW NE NW 14-1s-14w, show oil, T.D. 1,314 ft.
Geneva Township: Alfred R. Urion 1 Wilson, NW NW NW 3-1s-16w, temporarily abandoned at 106 ft.

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LEASES—East Texas, La., South Ark. 20 acres up, dollar acre up.—Owners—Address Attorney, Box 1122, Little Rock, Ark.

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Oil and Gas Leases and Royalties.
ROY G. BARTON, Hobbs, N. M.

FOR SALE: Oil and gas leases and small production located in Kentucky shallow field, also tracts of proven Fluorspar and zinc deposits. Reports on request. W. P. HARLEY, Bowling Green, Kentucky.

WARD-Crane sec. 18B 28, near Silurian test; cheap fee or lease. J. G. Smith, 215 Littlefield Bldg., Austin, Texas.

MICHIGAN—1,160 acres to lease for Oil and Gas. Map free. Owner: L. J. Meldrum, 8354 Epworth, Detroit, Mich.

ATTENTION promoters: Block of leases, geology and structure in 30-47, 30-48. Write Box 312, Springfield, Colo.

M E N E X W E I C O — State Oil & Gas Leases and Landowner's Royalties — Harry S. Wright, Farmington, N. M. — M E N E X W E I C O

FOR LEASE: For oil and gas purposes. 240 acres in Anderson County, Kansas. Oil and gas were drilled in at a shallow depth. W. M. DARY, 3605 East Anaheim, Long Beach, Calif.

WANTED TO BUY: Small production or exhausted leases in Kansas, Oklahoma and North Texas. Write location, brief description and price. Box A-553, The Oil and Gas Journal, Tulsa, Okla.

Geologic Survey

GEOLOGICAL Survey bulletins listed by states. Send for lists. For sale by J. C. Howgate Bookseller, 120 So. Church, Schenectady, N. Y.

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THE GRAVITATIONAL SELECTOR IS THE ANSWER TO THE SAFE DEVELOPMENT OF NEW POOLS. It is the quickest, the surest, the cheapest and gets RESULTS when other systems fail. Write Geologist, 14957 Lakewood Heights Boulevard, Lakewood, Ohio.

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A 1500 BBL. skimming and cracking plant for lease, ample oil can be secured, wide local markets for products. Must have ample working capital; located in West Texas; no promotion. Address inquiries to Box A-512, The Oil and Gas Journal, Tulsa, Okla.

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BURKHART'S legal blanks and general forms serving Mid-Cont. oil field since 1908—Okla. Kans. N. Mex. Tex. Ala. Ark. Fla. Ga. Ill. Ind. Ky. La. Mich. Miss. Mo. Neb. N. Dak. Tenn. Wyo. Free catalog samples on request. Burkhart Ptg. & Sta. Co., 115 S. Cinn., Tulsa, Oklahoma.

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Mining Opportunities

AMERICAN Cons. Mng. Engr. of recognized ability, reputation and integrity who is thoroughly informed on all metals and minerals of Mexico as he has operated and examined mines and prospects for large and reputable American and British companies for 30 years, seeks capital to take up claims or under option large and small gold, gold-silver, lead-silver-zinc highly meritorious properties in the richest mining state of Mexico. All will stand thorough investigation and examination and can be rapidly placed on a highly profitable basis. Address Box A-540, The Oil and Gas Journal, Tulsa, Okla.

Situations Wanted

REFINERY Engineer, Superintendent, Manager. Well experienced in design, construction and operation of modern refinery equipment. Age 41. Box A-480, The Oil and Gas Journal, Tulsa, Okla.

EXPERIENCED lease and title man desires work assembling block leases or title curing. Has own car. Can give references to honesty, ability, efficiency and diplomacy. 12 years' experience. Married. Box A-543, The Oil and Gas Journal, Tulsa, Okla.

EXECUTIVE with twenty-five years' experience in the producing and land departments, part of this time as executive vice president of major Independent company which was merged with a major company, desires connection independent company or parties with money to invest in the oil business as there are many opportunities in the southwest country to make money. Box A-541, The Oil and Gas Journal, Tulsa, Okla.

REFINERY Engineer, experienced in design, maintenance, construction, operation, budgets, cost control, standardization of material and equipment, purchasing. Box A-521, The Oil and Gas Journal, Tulsa, Okla.

EXPERIENCED light oil treater, 7½ years in major oil company refinery. Draft classification III. References. Box A-552, The Oil and Gas Journal, Tulsa, Okla.

SECRETARY AND ASSISTANT—Young graduate Industrial Engineer desires the position of Secretary or Assistant to Engineer, Manager or Executive. Deferred Draft Status. Experienced in Valuation, Continuing Property Records, and Engineering. Familiar with drilling, production, and pipe line work. Excellent draftsman, University teaching experience. Employed at present as Valuation Engineer for eastern production utility. Available August 1, excellent references. Box A-551, The Oil and Gas Journal, Tulsa, Okla.

Help Wanted

PIPING Draftsmen experienced in process plant layout, equipment piping and related work. Several excellent opportunities for capable men who wish employment in growing business in the Pittsburgh district. Write, stating qualifications and salary expected. All replies will be handled confidentially. Address Box A-514, The Oil and Gas Journal, Tulsa, Okla.

MACHINIST capable of maintaining Worthington BG and CG gas engines, centrifugal and reciprocating pumps including hot oil pumps, also operation machine shop tools. Refinery experience preferred. Open shop. Box A-520, The Oil and Gas Journal, Tulsa, Okla.

WANT—Good joint turner in oilfield shop. Year around job $1.25 per hour. In good town, Rocky Mountain area. Box A-545, The Oil and Gas Journal, Tulsa, Okla.

REFINERY EQUIPMENT INSPECTOR, qualified to carry on actual refinery equipment inspection, interpret results and combat corrosion problems. Inspection would be primary duty but would be expected to do general engineering work during slack period. Inspection experience necessary. Write, stating qualifications and salary expected. P. O. Box A-550, The Oil and Gas Journal, Tulsa, Okla.

Equipment Wanted

WANTED: All makes of used Diesel Engines, preferably "Caterpillar" Diesels Write price, condition and location to Fabick Tractor Co., Box 503, Salem, Ill.

WANTED TO BUY—Good used 3, 4 and 6-inch line pipe and fittings. Write P. O. Box 692, Charleston, S. C.

WANTED: Late model 6¾ x 12 National Slush Power pump or late 6 x 12 OILWELL; 2500 to 4500' 2½" INTERNAL FLUSH drill pipe. A. W. Adkisson, 2019 W. T. Waggoner Bldg., Ft. Worth, Texas.

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FOR SALE—At Coyle, Oklahoma, One Steam Drilling Rig complete, less drill pipe, rotary table and traveling block. Equipment capable of drilling to depths 6500 to 8000 feet.
T. T. EASON AND COMPANY
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FOR SALE at Oklahoma City: 1 Jones Super Woodworker with four cylinder Le Roi Engine. I.T.I.O. Co., Bartlesville, Okla.

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Designed for a heat absorption of 3,000,000 B.T.U. per hour, complete with setting and circulating pump. Trinity Cotton Oil Co., Dallas, Texas.

$3500.00 BUYS complete steam drilling rig in N. Louisiana, ready for work. Inventory on request. Claude L. Johnson, Attorney, Whitney Bldg., New Orleans, La.

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***"Anything* containing IRON or STEEL"**

FOR SALE near Barnsdall, Oklahoma: 2—Griscom Russell DAA-248 Twin G-Fin Sections. Serial Nos. 62230-1 500# maximum W. P. $100.00 each section. I.T.I.O., Bartlesville, Okla.

PULLING MASTS: Welded A-Frame type with 5⅛" and 7" tubular legs and single sheave crown. Lucey Products Corp., Tulsa, Okla.

FOR SALE at Oklahoma City: One 4" Belt Driven Manistee Single Stage Type CW Centrifugal Pump, 300 GPM, 50' Head, 1760 RPM. $100.00. I.T.I.O., Bartlesville, Okla.

COMPLETE
CORE DRILLING UNIT

Good for 2,000 feet, mounted on 1940 Model AC403 GMC Truck, equipped with 2 speed Eaton rear axle—500 feet 2⅝" O.D. drill rod with 3" Fl'ge couplings—15 Drill bits—Offered for immediate sale—

SONKEN-GALAMBA SUPPLY CO.
Tulsa, Oklahoma

FOR SALE: Pressure vessels 8' diameter by 31' 8" long. Tested 200 pounds hydrostatic pressure. Suitable for butane, propane or as pressure wood creosoting treating units. Harvey Bros., 706 Rudd, Canon City, Colo.

FOR SALE at Oklahoma City: Reconditioned 12" Goulds Fig. 3065 Single Stage, Double Suction, Centrifugal Pump with bed plate for motor mounting, 6,000 G.P.M., 96 ft. head, 1175 R.P.M. —I.T.I.O. Co., Bartlesville, Okla.

FOR SALE: Large Gasoline Plant now being dismantled. Bessemer machinery, tanks, regulators, pipe of all sizes, and other miscellaneous equipment. GILBERT PIPE & SUPPLY, Electra, Texas.

SALE—New 9⅝"—13¾"—13" O.D. Casing Couplings. Want to buy a SHEAR and PLATFORM SCALE. Box 574, Tulsa.

FOR SALE: 2 Wilson pulling units with 125 HP. Waukesha motors. Excellent condition. Lucey Products Corp., Tulsa, Okla.

FOR SALE: Star Thirty Special Drilling Rig, with complete set of tools CASEY DRILLING COMPANY, Casey, Ill.

SPECIAL OFFERING—PRICED FOR IMMEDIATE SALE

10—12¾" O.D. Used River Clamps
Weight 1650 pounds each
97—8⅝" O.D. Used River Clamps
Weight 850 pounds each
These river clamps are in good condition. If interested wire, write or phone

THE MILLER INTERESTS
902 Palace Building
Tulsa, Oklahoma
Phone 2-2236.

ONE 50 H.P. Bessemer type GD Single Cylinder Gas Engine. $300.00. I.T.I.O., Bartlesville, Okla.

IT'S A FACT—

that year after year these columns carry more Classified Advertising than the combined totals of all other media devoted to the oil industry.

RESULTS account for this remarkable record. Write for rates

Classified Department

The Oil and Gas Journal
Tulsa, Oklahoma.

FOR SALE: At Oklahoma City warehouse, late Model No. 36 Sullivan core drill mounted on Ford truck. I.T.I.O., Bartlesville, Okla.

FOR SALE: Gas Meters. Orifice and Positive. George R. Milner, Box 457, Okmulgee, Oklahoma.

45 STAR Spudder, self propelled, 90 HP Hercules, like new, with attachments. $3.000. J. S. Wise, Okmulgee, Okla.

FOR SALE: New Buda Engine Model H119, 22 HP, 1200 RPM, Twin Disc Clutch, housing, etc. $196.00. Viking Pump Co., Cedar Falls, Ia.

FOR SALE: At Seminole—Used Cardwell K.S. DHS Skid type oil well servicing unit equipped with DHK Waukesha motor. I.T.I.O., Bartlesville, Okla.

CATERPILLAR 75 diesel with Cardwell 10,000 foot servicing winch in A-1 shape, tracks like new, motor rebuilt. Price $7,000; Cost new $12,000. Box A-532, The Oil and Gas Journal, Tulsa, Okla.

FOR SALE at Bartlesville: One 8" x 3¼" x 8" Ingersoll-Rand High Pressure Portable Compressor. I.T.I.O., Bartlesville, Okla.

FOR SALE: 125 H.P. 200 W.P. Broderick Boiler. Code Condition. $975. Melton Supply Co., Seminole. Okla.

FOR SALE at Oklahoma City: 2—72" x 8' Southwestern Tangential Gas Scrubbers. 75# W.P.—115# Test. I. T. I. O., Bartlesville. Okla.

2—#45 Star S.T. Spudders or will trade for production. Bert Miller, Phone 623, Salem. Illinois.

TRACTORS

Caterpillars, crawler type, size "35" $375; size "65" with nigger head winch $795.00; Allis-Chalmers, model L with bulldozer $1850; Austin Western hydraulic grader 10' blade $650. O. C. Evans, Mt. Sterling, Kentucky.

FOR SALE—2 strings Rotary Tools offered at Bargain Prices. Capable of drilling to 3500 feet. Located on Gulf Coast. Inventory on request. Address inquiries to Box 670, Fort Worth, Texas.

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HUNTING & FISHING
Here's your answer to . . . *where, when,* and *how,* to catch more fish and get better hunting . . . Read OutdoorsMan the national magazine for sportsmen. Get it at newsstands, 15c or send 15c in stamps to the publication. Its beautiful man and boy cover is ideal for framing. OutdoorsMan, 384 South Fourth St., Columbus, Ohio.

Oil Industry Printing

OIL FIELD LEGAL BLANKS
Leases, assignments, releases, township plat books, well records, etc. Request on your letterhead gets free catalog. Olds Press, 215 East Third St., Tulsa, Okla.

CRUDE-OIL PRICES IN REPRESENTATIVE FIELDS

East Texas	$1.25
Conroe	1.43
Tepetate, Louisiana	1.18
Smackover, Arkansas, heavy	.83
Illinois basin	1.37
Pecos County, Texas	.95
Lance Creek, Wyoming	.92
Bradford, Pennsylvania	2.55

Gravity Schedules

Top prices include all gravities above grades designated, and low prices include all gravities below grades designated:

Gravity	Signal Hill Calif.	Okla. homa, Kansas	Gulf Coast, Texas	West Texas, Lea County, N. M.
18-18.9	$0.80	...	...	...
19-19.9	.84	...	$1.06	$0.70
20-20.9	.88	$0.85	1.08	.72
21-21.9	.92	.87	1.10	.74
22-22.9	.96	.89	1.12	.76
23-23.9	1.00	.91	1.14	.78
24-24.9	1.03	.93	1.16	.80
25-25.9	1.07	.95	1.18	.82
26-26.9	1.11	.97	1.20	.84
27-27.9	1.15	.99	1.22	.86
28-28.9	1.18	1.01	1.24	.88
29-29.9	1.20	1.03	1.26	.90
30-30.9	1.23	1.05	1.28	.92
31-31.9	...	1.07	1.30	.94
32-32.9	...	1.09	1.32	.96
33-33.9	...	1.11	1.34	.98
34-34.9	...	1.13	1.36	1.00
35-35.9	...	1.15	1.38	1.02
36-36.9	...	1.17	1.40	1.04
37-37.9	...	1.19	1.42	1.06
38-38.9	...	1.21	1.44	1.08
39-39.9	...	1.23	1.46	1.10
40 and above	...	1.25	1.48	1.12

Crude-Oil Price Changes

(Continued from Page 132)

Oil & Transportation Co., effective June 19, advanced Somerset crude 3 cents in the Kentucky River district and raised Big Sandy River crude 6 cents.

Changes in the areas advanced and representative prices in other sections are shown in the following tables.

MIDDLE WEST

Kentucky

Ashland Oil & Transportation Co., 6-19-41:	
Big Sandy River	$1.38
Kentucky River	1.43
Sohio Corp., 5-21-41:	
Birk City	$1.15

EASTERN STATES

Pennsylvania and Ohio

South Penn Oil Co.:	
National lines, 6-18-41	$2.75
Southwest Penn, 6-18-41	2.40
Eureka lines, 6-18-41	2.34
Corning grade, 5-27-41	1.31
Tide Water Associated Oil Co.:	
Bradford, 6-18-41	2.75
Allegany, N. Y., 6-18-41	2.75
Pennzoil Co.:	
Group A, 6-18-41	$2.68
Group B, 6-18-41	2.67
Group C, 6-18-41	2.66
Group D, 6-18-41	2.65
Group E, 6-18-41	2.63
Quaker State Oil Refining Corp.:	
In Buckeye lines, 6-18-41	$2.30
In Eureka lines, 6-18-41	2.34

West Virginia

Pure Oil Co.:	
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100 years ago John A. Roebling founded the company which still bears his name.

» » Today, after a century of service, the name Roebling is still synonymous with leadership in wire manufacture, improvement and application.

» » In celebrating its 100th Anniversary, Roebling looks forward to the opportunity of serving industry in even greater measure than ever before.

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TRENTON, NEW JERSEY

in "tough" piping assemblies

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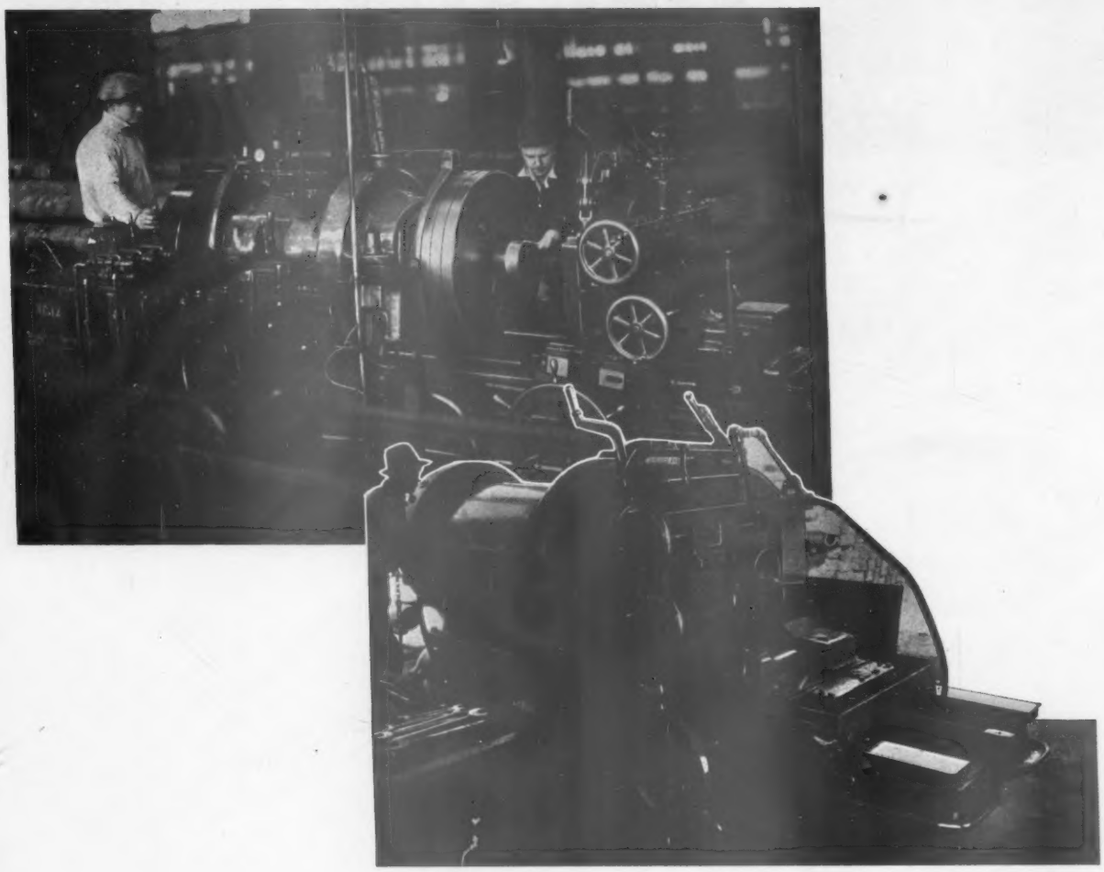

The accuracy of the Landis cut thread—its true form, correct taper, and quality finish, regardless of the grade of the casing, tubing or drill pipe, used—assures fast, leak-proof piping assemblies.

Landis Pipe Threading and Cutting Machines equipped with the Receding Chaser Die Head is universally used in oil field shops, throughout the world, and in the plants of manufacturers of oil well tubular goods, because of their, more than ordinary, ability to produce accurate results—economically.

May we tell you more about this "better" way to thread casing, tubing, and drill pipe?

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Ships that swallow with throats of rubber

A typical example of Goodrich improvement in rubber

THOSE underslung ships you sometimes see are tankers, hustling oil from well to refinery. The tanker swallows its 3,000,000-gallon load through mammoth hose—but it used to be a slow swallow while the costly tanker waited.

Oil makes rubber swell. To prevent it, hose was lined with fabric. But oil penetrated to the rubber, swelled it anyway, and as the swelling gradually closed the rubber throat, flow was reduced, loading time expensively increased. Then flat steel wire was used in hose lining to hold the rubber in place, but the swelling forced itself between the wires, made ridges that caused friction with the oil, again slowed flow. Tankers continued to waste expensive time in port.

Goodrich engineers, who had made important improvements in many other types of hose, tackled this problem. Goodrich had perfected compounds of synthetic rubber which *resist* oil. Could they resist tens of millions of gallons?

The answer is in the photograph. That hose has handled three *billion* gallons of oil and is still at work. And because its smooth synthetic lining *stays* smooth, tankers are loaded as much as ten or twenty per cent faster—hundreds of dollars are saved every trip.

In addition to speeding flow and so saving time, the Goodrich hose lasts longer than the old type, and is lighter and so easier to handle... these improvements resulting from Goodrich research. Have you checked lately with your Goodrich Distributor to see what improvements this constant Goodrich research has made in the rubber products you buy? *The B. F. Goodrich Company, Mechanical Goods Division, Akron, Ohio.*

B.F. Goodrich

First IN RUBBER

TWELVE WORDS — and they tell a mighty important story of gasoline saving at the marine terminal of Home Oil Terminal Company on the Ohio River, Henderson, Kentucky.

Five cone roof tanks manifolded to one Graver Expansion Roof tank designed to eliminate evaporation loss and to reduce filling loss to an absolute minimum.

And they're all working tanks too, with a combined capacity for 1,400,000 gallons. Much of the time gasoline is being pumped from barge to receiving tank to elevated truck-loading tank, yet there is no evaporation loss and very little, if any, filling loss.

The Graver Expansion Roof is paying its way here just as other installations are paying their way for many companies.

And it will pay its own way at your plant.

Full particulars are waiting for you. Don't fail to investigate the "long term" economy afforded by the Graver Expansion Roof.

Graver Expansion Roof (in foreground) saving gasoline vapor from one 400,000, two 300,000, one 200,000, and two 100,000 gallon tanks.

Roof has 10′ lift and sufficient capacity to retain all vapors that may form under most extreme conditions. Underground lines connect vapor space of all tanks.

GRAVER TANK & MFG. CO., INC.

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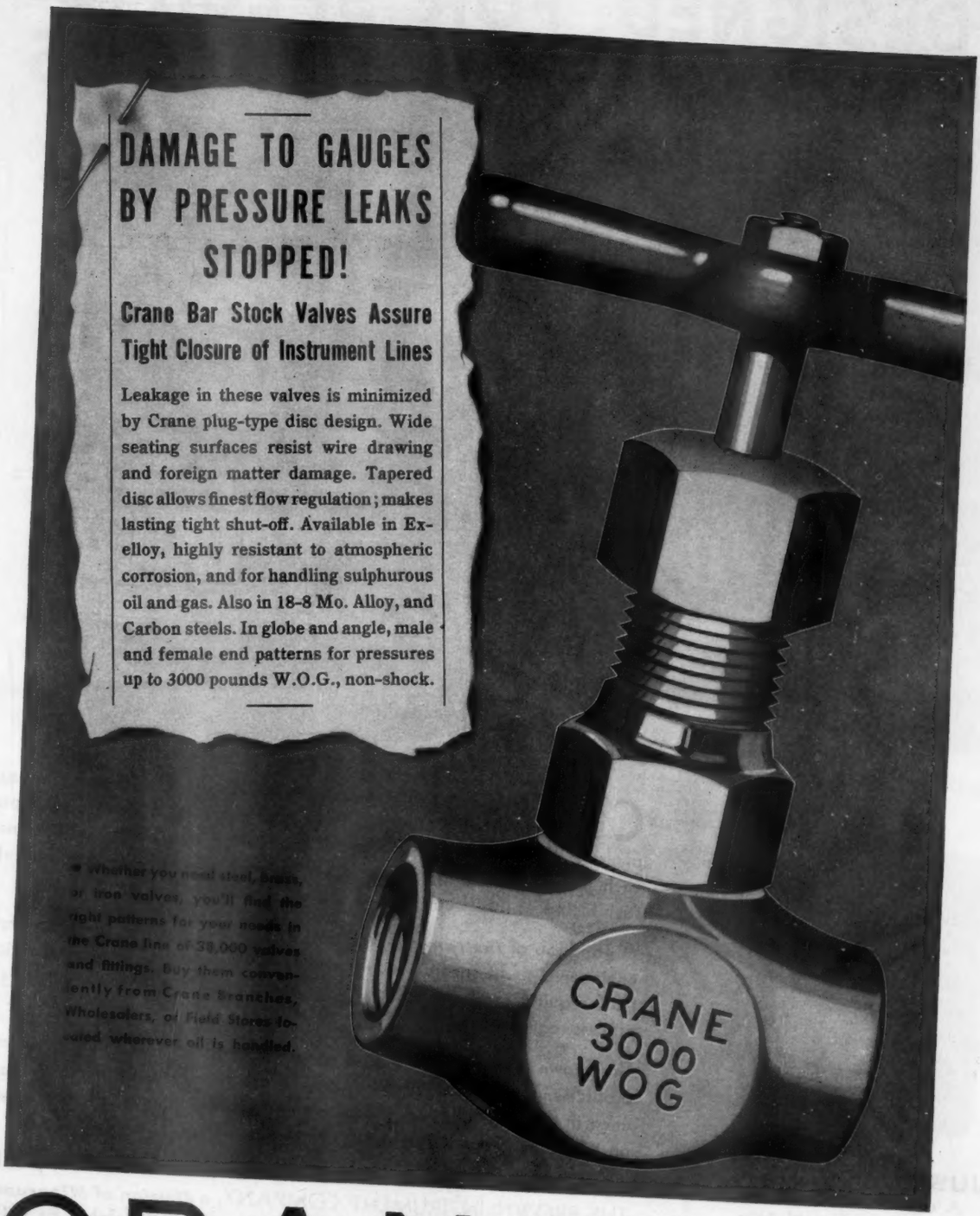
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Leakage in these valves is minimized by Crane plug-type disc design. Wide seating surfaces resist wire drawing and foreign matter damage. Tapered disc allows finest flow regulation; makes lasting tight shut-off. Available in Ex-elloy, highly resistant to atmospheric corrosion, and for handling sulphurous oil and gas. Also in 18-8 Mo. Alloy, and Carbon steels. In globe and angle, male and female end patterns for pressures up to 3000 pounds W.O.G., non-shock.
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PIPE • PLUMBING
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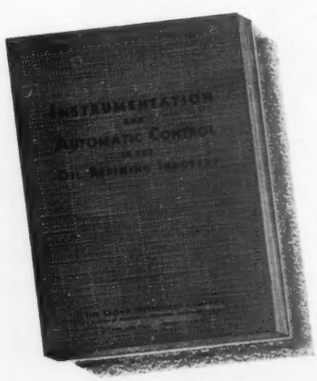
The Oil and Gas Journal, issued weekly by The Petroleum Publishing Company, 211 South Cheyenne Avenue, Tulsa, Oklahoma. Subscription price: Domestic $6.00 a year, foreign, $7.00 a year. Entered as second-class mail matter December 15, 1911, at the post office at Tulsa, Oklahoma, under the Act of March 3, 1879.

DESIGNED FOR SPECIFIC REFINERY REQUIREMENTS



JUST OFF PRESS

A copy of this 180 page book covering Instrumentation and Automatic Control applications in the Oil Refining Industry will be mailed to consultants and refinery engineers requesting same on company letter head.

CONSULTING engineers and contractors to the Oil Refining Industry have no stock blue prints to use for your new cracking plant . . . topping plant . . . treating plant . . . or boiler house. They must design and engineer each job to the specific requirements of your refinery, weighing carefully such factors as initial costs, operating efficiencies and ultimate yields.

A good job of *Instrumentation and Automatic Control* is also carefully engineered to fit specific requirements. No two control jobs are identical. Each requires careful weighing of engineering data and sound analysis of process requirements.

The Brown field organization is ably equipped to handle your particular problems. Their engineering training is supplemented with practical experience in the field of plant processing and their recommendations are based on a thorough knowledge of your requirements.

Call in a Brown Engineer. He will help you solve your control problem. THE BROWN INSTRUMENT COMPANY, *a division of Minneapolis-Honeywell Regulator Co.*, 4488 Wayne Avenue, Philadelphia, Pa. Offices in all principal cities. Toronto, Canada: 117 Peter Street—Amsterdam-C, Holland: Wijdesteeg 4—England: Wadsworth Road, Perivale, Middlesex —Stockholm, 16, Sweden: Nybrokajen 7.

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● This pipe line carries gasoline 270 miles to help meet the needs of Chicago motorists. It's Republic Electric Weld line pipe, 8⅝ inches O. D. In the construction of this line only a minimum number of field welds were made because the pipe averaged over 49 feet per length. Other features for you to remember when you construct a line—perfect roundness and uniform wall thickness to speed up welding—ductility to make bending easy alongside the trench—clean inside, no clogging scale—clean outside to facilitate doping and wrapping. And we can ship Republic Electric Weld Line Pipe in sizes up to 16-inch O. D. faster than you can lay it.

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If our American way of life is to survive, every industry must work in close cooperation with the industries that serve it and, in turn, with the industries it serves during this period of peak demand for goods.

A rush for materials is very much like a run on a bank—and can be equally dangerous unless cool heads analyze and plan.

We, in Republic, are doing just that—analyzing the orders we receive and planning our production, so that our greatly enlarged blast furnace, electric furnace and rolling mill facilities can be as helpful as possible to the greatest number of buyers in serving America's urgent need for ***steel—first line of national defense.***

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PRESIDENT

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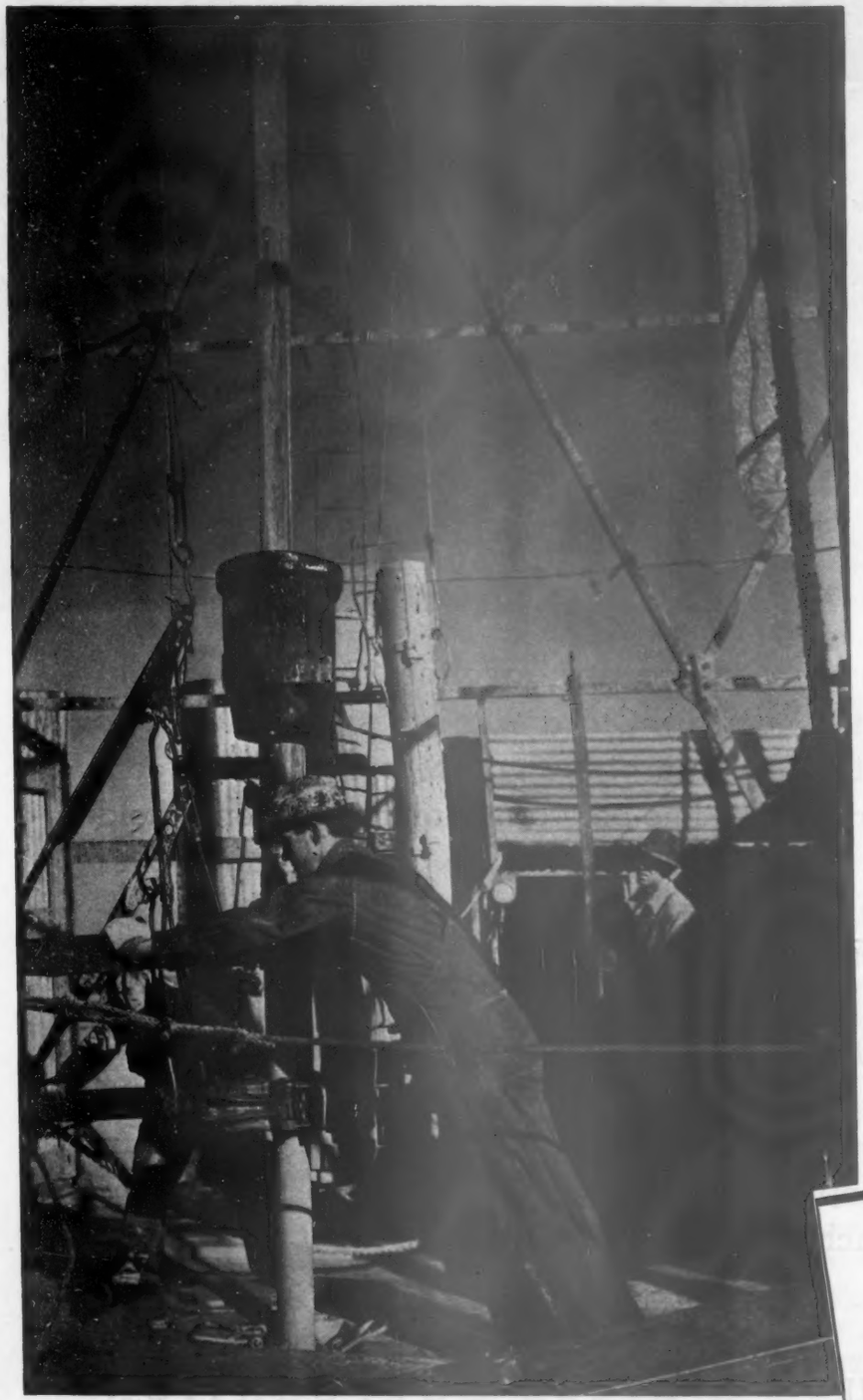

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IN oil field and refinery, where no ordinary steel will do, you can safely rely on U·S·S Carilloy Alloy Steels. Carefully selected by the jungle law of survival of the fittest, these steels—tough, strong, highly resistant to impact, shock, abrasion, to heat and corrosion*—assure the utmost reliability under the severest conditions.

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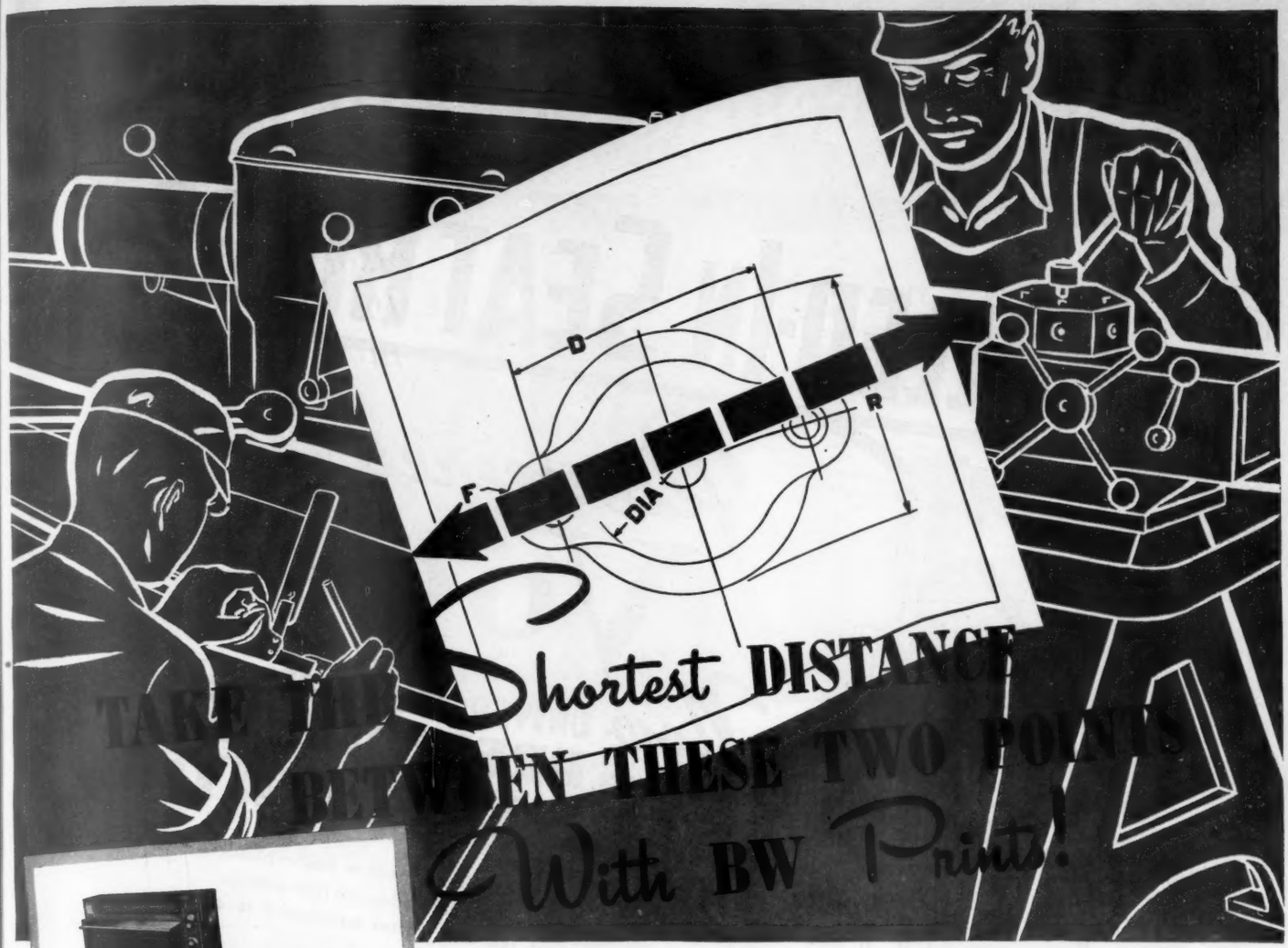

BRUNING "75" PRINTER AND 154 BW DEVELOPING MACHINE

These two machines will provide the high efficiency print production to gear your print department to today's needs. One man can develop 1200 8½ x 11 BW Prints per hour, and two men can develop 2600 8½ x 11 BW Prints per hour.

Prints up to 42" in width, any length, can be handled.

The Bruning booklet, "New Light On Prints," fully describes the "75" Printer and the Model 154 Developer, and gives information about other Bruning printers and developers. Send for your copy.

YOU take the shortest possible time between plan and product when you use Bruning BW (black line) Prints, instead of blue prints.

The reasons are simple. BW Prints are produced in *seconds*—rather than the minutes that blue prints require. BW Prints require *two* simple steps—exposure and development—while blue prints require five. BW Prints need no washing and drying. BW Prints permit big volume production of prints cut to the exact size of your tracings—no unrolling and cutting of roll stock to get the prints you want. No wonder BW Prints smooth out "kinks" in production all along the line!

Bruning representatives have facts and figures to show you why you can save time—and money—with Bruning Black and White Prints. For faster production, get in touch with one soon—and mail the coupon now for complete information about BW.

BRUNING *Since 1897*

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Please send me free literature on the Bruning Black and White Direct Printing Process.

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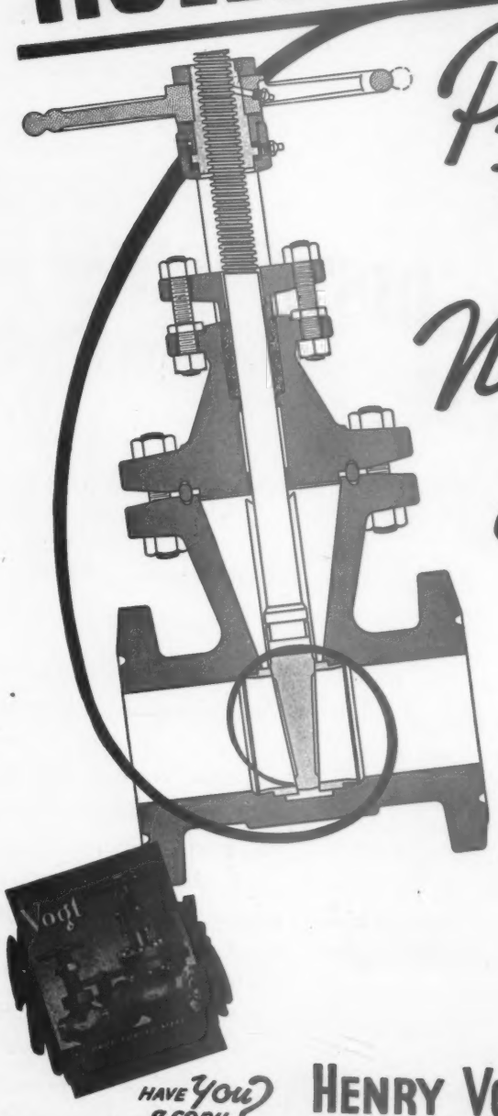
ROLLED-IN SEAT RINGS

Pioneered by

Vogt



Now UNIVERSALLY ACCEPTED AND **PREFERRED!**

Five Reasons **WHY:**

- NO THREADS to corrode or leak—Metal-to-metal contact of rolled-in seat rings provides a tight seal and reduces maintenance to a minimum.
- DOUBLE TIGHTNESS obtained by contact between body and seat on both the shoulder and the flare end of the seat.
- SEATS WON'T TURN or loosen in service, due to special design.
- STREAMLINE FLOW thru the valve—Absence of lugs or wrench grips minimizes turbulence and reduces pressure drop.
- EASILY RENEWED if required—Seats can be removed with an ordinary steel rod. Only a swage or roller is required to install new seats.

HAVE YOU a copy!

Vogt's complete line of Drop Forged Steel Gate Valves is described in this brochure. Sent upon request.

HENRY VOGT MACHINE CO., INC.

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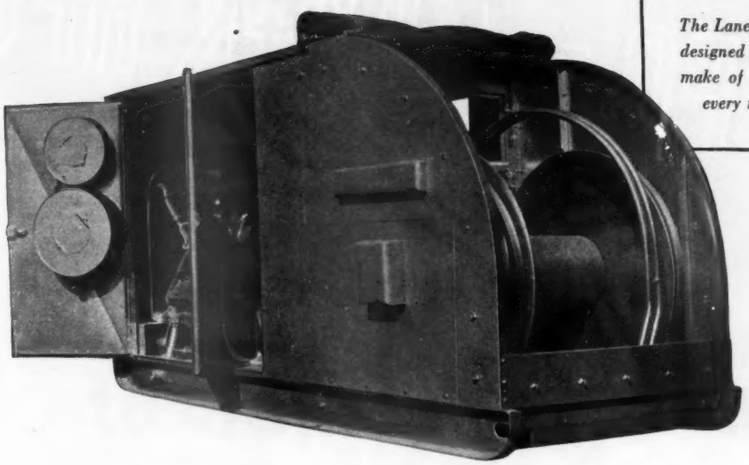
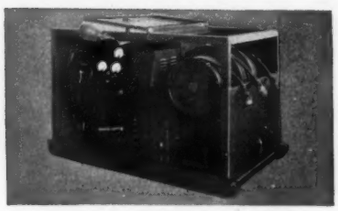
DROP FORGED STEEL VALVES

LANE-WELLS *Gun Perforator*

The Lane-Wells skid Unit Gun Perforator is designed for mounting on the flat bed of any make of truck or barge. It is complete in every mechanical and electrical detail.



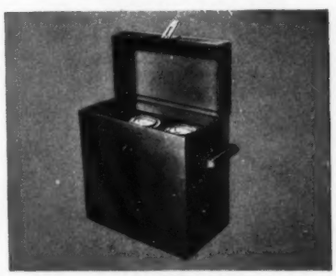


The Lane-Wells Electrical System Central Control Unit contains all the electrical control equipment used in the Special Service Truck and Skid Units.

. . . for fields outside the United States and Canada

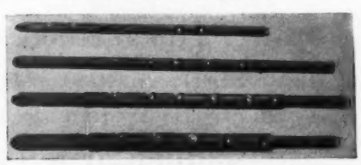
Four types of Gun Perforator Units are available for use by operators in fields outside the United States and Canada. Selection is determined by the amount of perforating to be done and the area in which the equipment is to be used.

The Skid Unit and the Special Service Truck Gun Perforator Units are equipped with from 8,000 to 15,000 feet of special conductor-core cable, hoist, generators, auxiliary hoisting controls, visual-registering, depth-measuring and weight indicating devices. All operating controls are so grouped that the operator has full knowledge of the gun location and weight on the cable without taking his eyes from the control panel. A two-way public address system permits the operators to be in constant communication, regardless of the distance of the Unit from the derrick. The sheave assembly over which the cable is run is suspended in the derrick. The synchronized motor depth indicator gives extremely accurate measurement of cable as the gun is lowered into the hole. The $\frac{7}{16}$" diameter improved plow-steel, preformed line has a tensile strength of approximately 9 tons. A five-point safety system of switches, that must be closed before the gun can be fired, protects men and equipment during operations at the well. Lane-Wells guns are of extremely high-pressure construction. Powder loads are packed to the correct density and placed directly behind the bullet to drive it from the barrel with greater force and less friction loss. The design and construction of Lane-Wells guns provide greater perforating power and deeper penetration into formation after casing and cement have been perforated.



Lane-Wells Portable Firing Control Panel, powered by "B" Batteries, is used for operating Lane-Wells Gun Perforator or setting Lane-Wells Bridging Plugs.

Lane-Wells Special Service Truck with custom built hoist and mechanical and electrical control systems. For use when gun perforating operations are performed regularly on a large scale and over a long period of time.



Four gun perforation sizes meet operating needs. 3½"—12 shot, 4¾"—12 shot, 5⅜"—12 shot and 6⅝"—10 shot. Other guns can be built to order.

SEND FOR COMPLETE DETAILS—*Inquiries about Lane-Wells Gun Perforator Units should be directed to Lane-Wells Company, 5610 South Soto Street, Los Angeles, California.*

LANE WELLS
Everywhere

– a low cost method of removing and recovering H_2S from butane and propane

The Shell Phosphate Process is one of the most efficient known methods for removing and recovering H_2S from the low-boiling hydrocarbons.

The method comprises two steps under fully automatic control: (1) scrubbing with a solution of K_3PO_4; and (2) regenerating the spent solution. An ideal raw material for the manufacture of sulfuric acid or elemental sulfur is recovered.

The Phosphate Process may be licensed by arrangement with Shell Development Company, 100 Bush Street, San Francisco. Write for information.

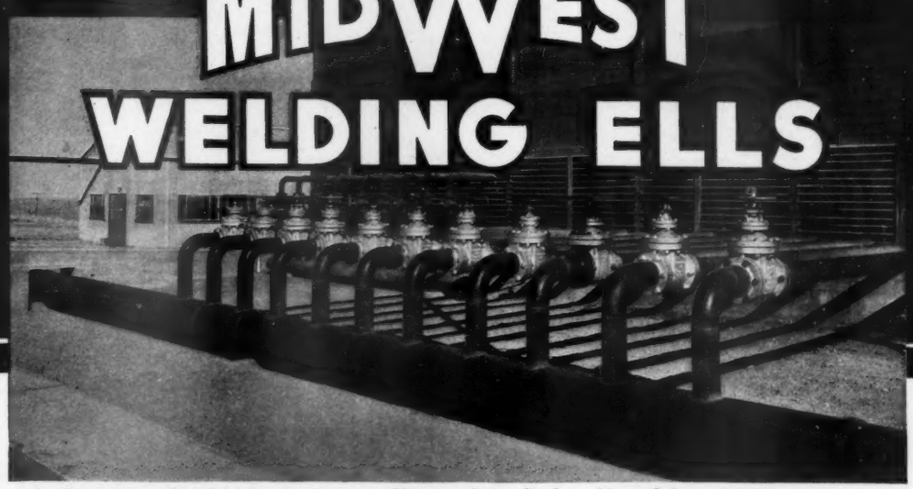
SHELL

SHELL DEVELOPMENT COMPANY

UNIFORMITY

AN IMPORTANT CHARACTERISTIC OF ALL

MIDWEST WELDING ELLS



As the column of cadets sweeps by . . . alike to the last button . . . precise in angle of chin and rifle . . . the impression is one of perfect uniformity.

Exact uniformity characterizes all Midwest Welding Ells. Every Midwest Ell of a given size and type is exactly like all its fellows. Midwest well knows the value of absolute uniformity in welding ells . . . knows it saves time (and money) in lining up pipe and fitting, and in the actual welding . . . knows it assures more uniform welds.

This exceptional uniformity of Midwest Welding Ells results from the special manufacturing process developed and patented by Midwest. Every Midwest Ell is reduced to accurate size and shape by a final working of the metal in compression at a forging heat . . . it is not extruded or stretched. This positive control provides (1) true circular cross section, (2) uniform wall thickness, and (3) accurate radius, included arc and tangents. Unique fixtures used to machine bevel the ends assure an included angle of exactly 90° or 45°.

Write for Bulletin 36 which explains the many other features of Midwest Welding Ells.

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Main Office: 1450 So. Second St., St. Louis, Mo.

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PATENT LICENSES IN THE PETROLEUM INDUSTRY

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A Subsidiary of The Texas Corporation

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Bucyrus-Erie 36-L

spudder of tomorrow

1. Modern all steel.
2. Electric arc welded.
3. Machinery mounted inside rigid trussed box frame.
4. 54-foot telescopic derrick with casing tackle strut to handle up to 50,000 lbs. static load.
5. Folding braces.
6. Rubber shock absorber . . . with means of blocking out for deep drilling.
7. Weighs approximately 26,000 lbs. on trailer without tools or lines. Comes within highway clearances.
8. Two speeds and instantaneous reverse on all drums with friction-clutch control.
9. Dual oversize brakes with equalizer on both bull reel and sand reel.
10. Bull reel carries up to 9,400′ of ¾″ line without divider.
11. Sand reel carries to 7,800′ of ½″ line without divider . . . chain drive.
12. Calf reel carries to 600′ of ⅞″ line.
13. Gasoline, natural gas, or diesel power. Gasoline engine (equipped with water-cooled manifold) develops 110 H. P. at 2,000 R.P.M.
14. 4 lengths drilling stroke from 20″ to 46″.
15. Power capacity in high gear to hoist 4,200 lbs. of tools from 3,000 ft. depth in 8 minutes.

COMPANION SPUDDERS AVAILABLE IN OTHER SIZES. WRITE FOR BULLETINS.

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Now—when minutes and materials are so vital to defense efforts—make full use of this service. Send for a check list of helpful publications, or submit your specific problem to:

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PUMPABLE OVER 8 HOURS

WITH 40% WATER AT 200° F.

4 BASIC ADVANTAGES

1. *Longer pumpability:* In excess of 8 hours, with 40% water (16½-lb. slurry), at 200° F.
2. *Higher strength:* Over 5000 lbs. in 24 hours, over 6000 lbs. in 48 hours, with 16½-lb. slurries, at 200° F.
3. *Lower initial viscosity:* Easier pumpability in heavy slurries . . . low pump pressures.
4. *Greater density:* Saw a 'Texcor' cube in half—notice its denser structure. Greater density, higher strength . . . longer lasting shut-offs!

HIGHER STRENGTHS, TOO: OVER 5000 LBS. IN 24 HOURS, 6000 LBS. IN 48 HOURS, AT 200° F.

LONGER pumpability than ever before . . . easy pumpability in heavy slurries . . . great density . . . high strengths. A basic advancement in oil-well cement, made possible by Lone Star's continuing research.

16½-lb. 'Texcor' slurries (40% mixing water) are pumpable in excess of 8 hours, at 200° F. An added safety factor in case of shut-down for repairs! Higher strengths, too: over 5000 lbs. in 24 hours, over 6000 lbs. in 48 hours, at 200° F.

Lower initial viscosity . . . more intimate mixture of cement and water . . . heavy, dense slurries flow easier with normal pump pressures. Hardened cement that is denser and stronger.

Use 'Texcor' . . . get the extra assurance afforded by a cement made to measure for deepest, hottest wells and highest pressures.

CHOOSE FROM 4 GREAT CEMENTS

'Texcor' is one of four high-quality cements for oil-industry service. 'Texcor'† for deepest wells . . . 'Starcor'* for deep wells . . . 'Incor'* for wells of moderate depth . . . Lone Star for all-around oil-field service. Quality pays—protect your investment by using Lone Star products.

†Trade Mark
*Reg. U.S. Pat. Off.

LONE STAR SYMBOL OF QUALITY SINCE 1900

...Keeping pace with Oil-Industry Progress

LONE STAR CEMENT CORPORATION

Makers of . . . Lone Star . . . 'Incor' . . . 'Starcor' . . . 'Texcor'

Photo Courtesy Axelson Manufacturing Co.

For Your Pump Shaft Grinding Jobs
Take Advantage of the Norton "B-E" Bond Wheel

Combining the features of hard, tough Alundum abrasive with the advantages of the improved "B-E" bond, this wheel is a favorite for all kinds of cylindrical grinding on steels and steel alloys.

On traverse cylindrical jobs, such as pump shaft grinding, it is the corner of the wheel, of course, that bears the brunt of stock removal and where wear first shows. And that's where the extra strength of the Norton patented "B-E" bond is appreciated. The corners of the wheel can "take it." Fewer dressings are necessary—wheel life is longer—grinding costs are lower.

NORTON COMPANY, WORCESTER, MASS.
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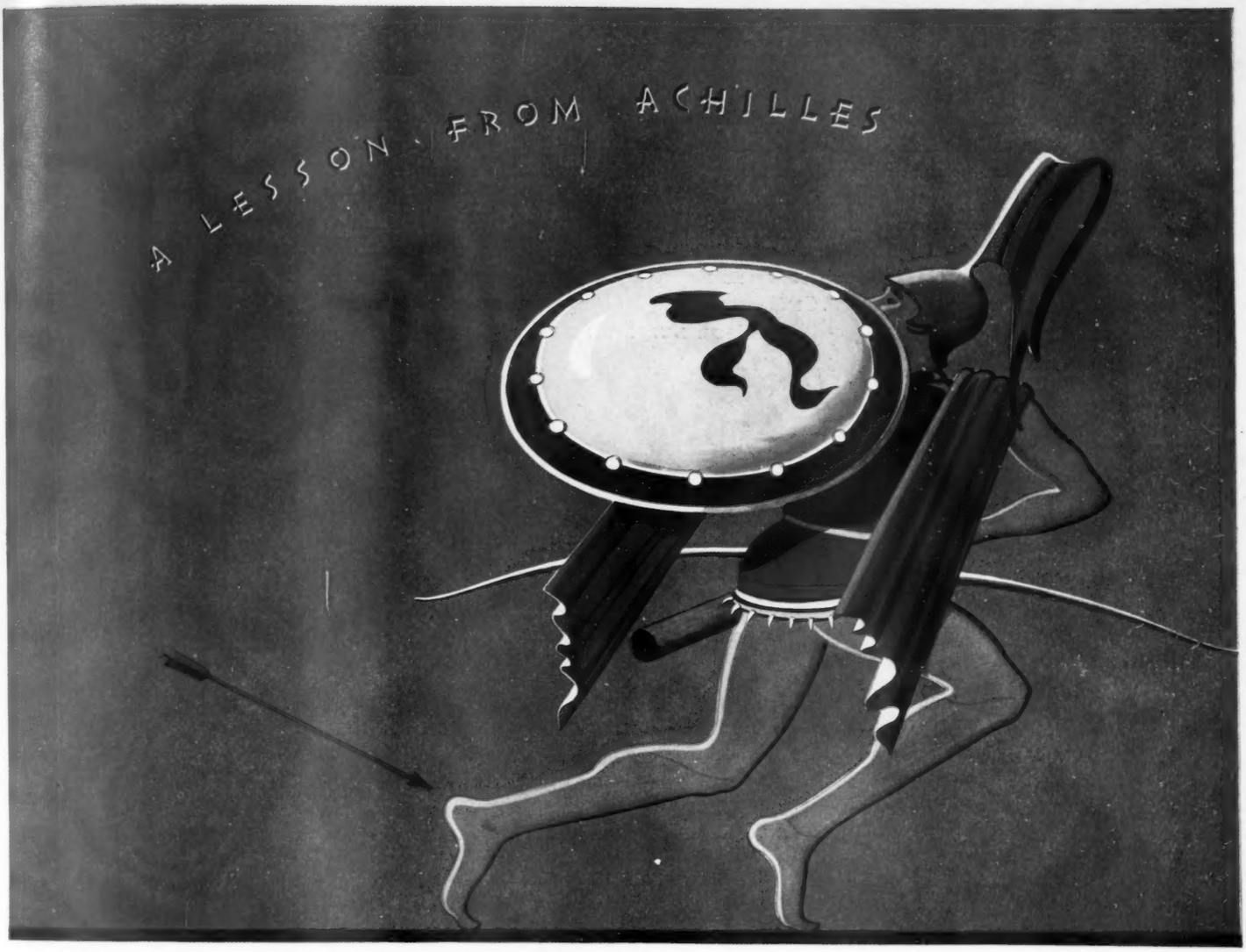
W-747

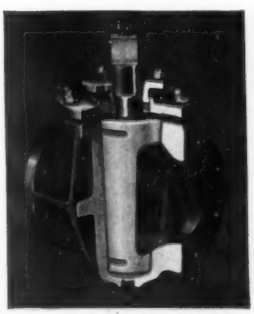
NORTON ABRASIVES



VULNERABLE VALVE LINES IN YOUR PLANT

FORM A FIFTH COLUMN

One "temperamental" valve on an important line in your plant or in the field might tie up your major flow of production. Check back in your experience and you can recall such instances. A single valve failure usually costs many times the price of the valve. ¶ Uninterruptedly, Nordstrom Valves are the "safety nerves" in well-engineered installations. They are literally the heart of the flow lines; easiest to switch flow; quickest to turn on or off; free from sticking; inherently protected against leaks by "Sealdport" lubrication. The plug is constantly seated. No sediment or deposits can creep in to prevent a tight closure. Nordstroms eliminate the weak, vulnerable points of line control.



KEEP UPKEEP DOWN

NORDSTROM VALVES

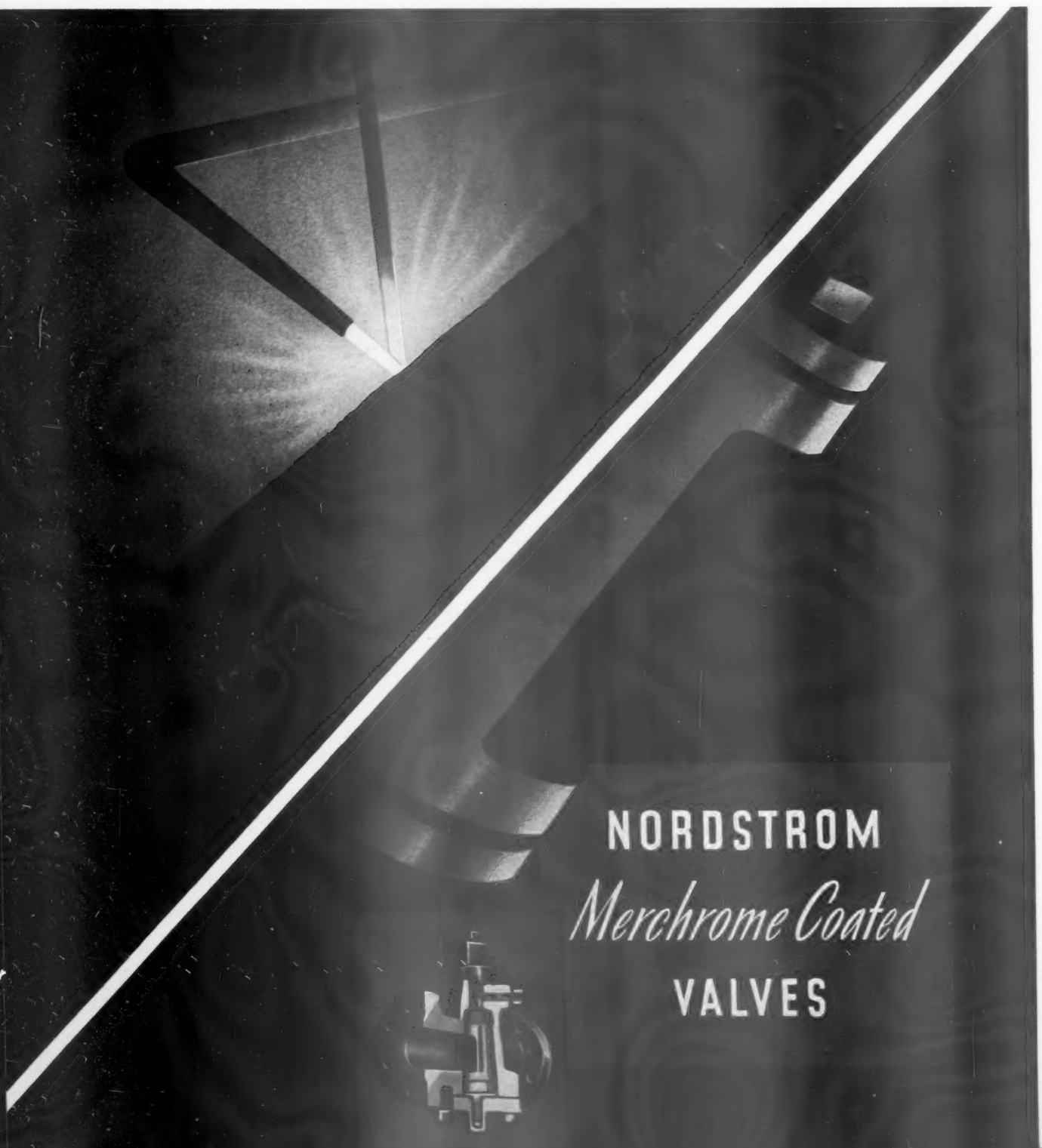
NORDSTROM PRODUCES THE ULTRA HARD-SURFACED VALVE — IT'S MERCHROMED

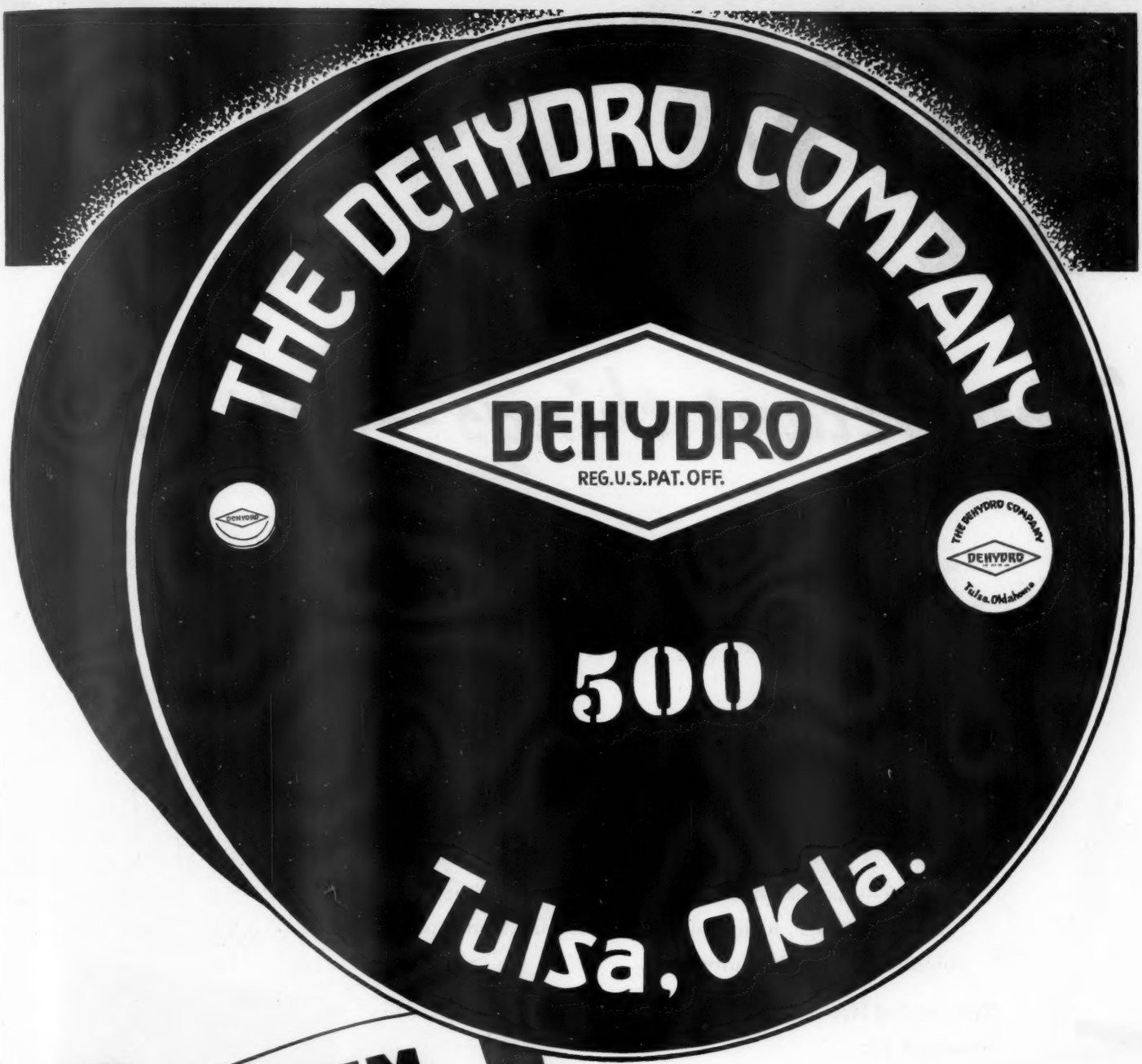
The amazing Nordstrom Merchrome Coated Valve defies corrosion and erosion. It retains its resistant properties and tight lubricated seal at temperatures up to 1000° F., and in some cases higher. This hard-facing is applied to the plug and companion surface of the body by the specially-developed Merchrome welding process (patented). Novel grinding methods permit precision finish. The surfaces *do not gall.* Coefficient of friction is extremely low. Hundreds of Nordstrom Merchrome Coated Valves are now in service where no other valves would successfully operate. In refineries, chemical plants, paper mills, on rotary drilling mud lines, and on certain corrosive gas lines, they are rendering unheard-of service, with practically no abrasion or corrosion. Investigate this revolutionary advancement.

Keep upkeep down with Nordstrom Valves.

ASK FOR BULLETIN

MERCO NORDSTROM VALVE CO. *A Subsidiary of Pittsburgh Equitable Meter Co.* **Main Offices: Pittsburgh, Penna.**





PETROLEUM TREATING COMPOUND

The effectiveness of Dehydro, as a treating agent, is recognized by the Oil Industry.

The service given by Dehydro does not cease with your purchase. Many years of experience acquired in successfully solving cut oil problems enables "Dehydro Engineers" to offer you practical assistance in working-out treating procedures.

Call the "Dehydro Engineer" in on your next treating problem. *There is no obligation for his service.*

THE DEHYDRO COMPANY... Tulsa, Okla.

RY

"important things"—better!

To minds focused on national defense the important things are:

First—aviation gasoline which Houdry is now producing from a variety of stocks and with less alkylate required for 100 octane grade.

Second—flexibility to meet the demands of the present emergency as well as future normal operations.

Third—operating simplicity as proved by actual commercial operating experience.

Fourth—superior quality and high yield of gasoline that is stable in storage, high in octane, low in gum, and a proved ability to meet all requirements.

The proof of Houdry's ability to do the important things better is evidenced by:

250,000 barrels capacity of Houdry Catalytic Cracking, Reforming and Treating plants now operating and under construction.

Licensing Agents for the Houdry Catalytic Cracking Process

E. B. BADGER & SONS CO.

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Engineers and Contractors for Petroleum Distillation and Refinery Equipment

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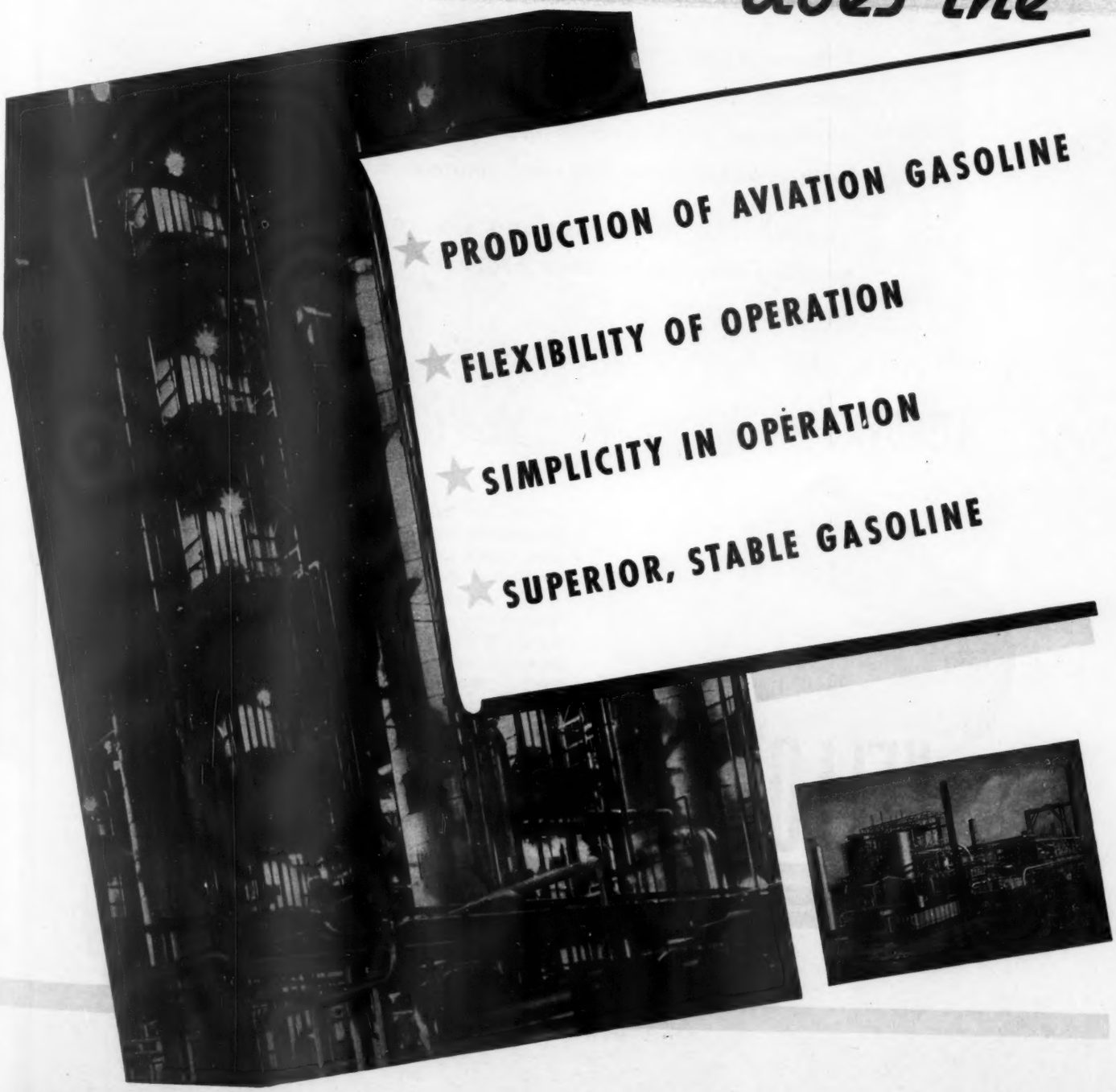

★ PRODUCTION OF AVIATION GASOLINE

★ FLEXIBILITY OF OPERATION

★ SIMPLICITY IN OPERATION

★ SUPERIOR, STABLE GASOLINE

Catalytic Cracking

CONTINUOUS PROCESS

The catalytic cracking process which permits continuous operation and produces high grade motor fuels with greater flexibility and economy.

Consult The M. W. Kellogg Co. regarding the "continuous process" of catalytic cracking.

KELLOGG

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- The Polymerization Process Corporation, Thermal and Catalytic Polymerization
- JUIK Processes for Lubricating Oil Refining with Propane and Phenol Deasphalting · Dewaxing · Solvent Extraction and Acid Treating Plants
- The Gray Processes Corporation, Clay Treating

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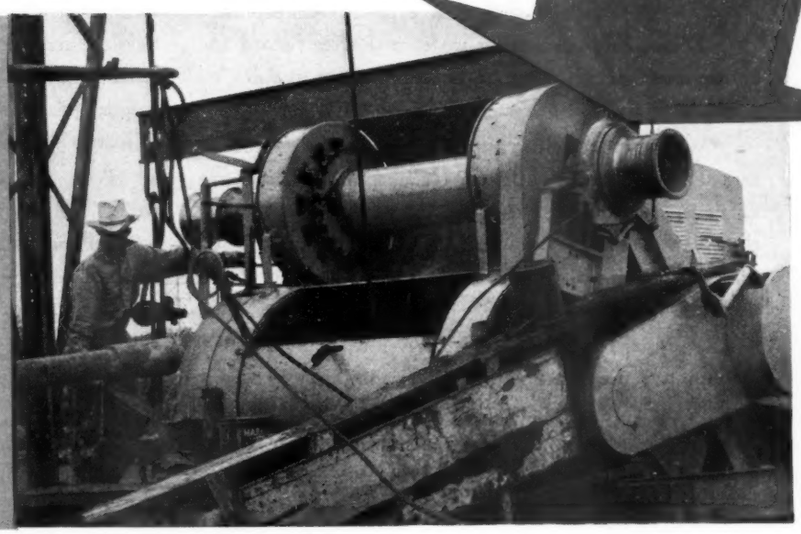
EUROPEAN REPRESENTATIVE: Compagnie Technique des Petroles, 134 Boulevard Haussmann, Paris, France.

CARDWELL USES *WORLD'S MOST POPULAR CATHEAD!*



● *Drillers like the American Cathead for its instant engagement, safety in operation, greater speed, and ease of maintenance. It's light in weight, compact, and contains but few parts.*

SPEED AND SIMPLICITY KEEP AMERICAN AS FAVORITE

● Don't take our word for it . . . check 'em . . . and you'll find that there are more American Catheads in use than any other single make. This means only one thing . . . that American Catheads are always "out in front" in performance . . . in simplicity of construction . . . in long wear . . . in safety and dependability. An excerpt from a letter from A USER sums it up in this way: ". . . we use American Automatic Catheads on our drawworks because of their very satisfactory performance, ease of installation and long service life with very low maintenance costs." Specify "American" . . . You'll find them superior, too!

AMERICAN
"SIMPLOMATIC" CATHEAD

AMERICAN
IRON & MACHINE WORKS CO.
OKLAHOMA CITY, OKLAHOMA
HOUSTON and MONAHANS, TEXAS
HARVEY and NEW IBERIA, LOUISIANA; GREAT BEND, KANSAS
Export Office: 420 LEXINGTON AVENUE, NEW YORK CITY
California Representative:
HOPPER MACHINE WORKS, INC., BAKERSFIELD, CALIF.

LEADERSHIP

OIL MEN who with their own eyes see "Caterpillar" Diesel Engines setting up record after record for continuous service without shut-down for repairs or overhaul, may say:

"Why bother with 'improvements'? Why not be satisfied with a fine product? 'Caterpillar' Diesels are efficient, dependable, rugged, long-lived. Every day they are proving that they can take any kind of punishment the oil fields can hand out — from above or below the ground.

"They can ably adapt themselves to many jobs — drilling, pumping mud, well or line pumping, well servicing. Their fuel system is simple; requires absolutely no operating adjustments; burns efficiently a wide range of Diesel fuels — including such low grades as No. 3 domestic burner oil. They can even be adapted to burn cleaned crude right from the lease. Or, through a conversion arrangement, easily made in the field, can use natural gas.* They are readily portable, easily set up, require practically no attention—no frequent or delicate adjustments; no specially trained attendant."

True, but "Caterpillar" engineering is *never* satisfied to let "well enough" alone. It is persistently striving for — and constantly achieving! — still greater quality and manufacturing precision; perfecting new features toward still finer performance and greater values in these world-famous power-plants.

**In Models D13000 and D17000.*

"Hi-Electro" hardened and Superfinished crankshaft journals . . . meaning greatly lengthened bearing life through harder, smoother wearing surfaces than is possible under any other practical method of heat-treatment and finishing.

"Hi-Electro" hardened cylinder liners . . . direct water cooled for superior cooling and ease of replacement; chemically treated for superior break-in.

Dual cooling — both water and oil are cooled — to provide uniform cooling and maximum lubrication efficiency. Air-type oil cooler (exclusive with "Caterpillar") reduces oil deterioration and provides cooler operating temperatures for bearings, pistons, rings and liners.

Complete dirt protection. Heavy-duty oil-bath air cleaners; combination absorbent and metal-edge type oil filters; completely enclosed valve-operating mechanism and flyball governor; absorbent-type fuel filters; metal-screened crankcase breather.

CATERPILLAR TRACTOR CO., PEORIA, ILLINOIS

DEPENDABLE Drilling Power. *Two "Caterpillar" Diesel D13000 Engines on Oilwell mud pump, and two D13000s on draw works. Operating for Lupher Drilling Co., near Centralia, Ill.*

DEPENDABLE Line Pumping Power. *A "Caterpillar" Diesel D17000 Engine driving Gaso pump for the Magnolia Pipe Line Co., near Salem, Ill.*

Congratulations, Mr. Cardwell on Your Achievements—

Our association with you and your splendid organization over this fifteen years has been a very happy one to which your generous statement that GATKE Brake Lining Products have contributed to your success comes as a gratifying climax.

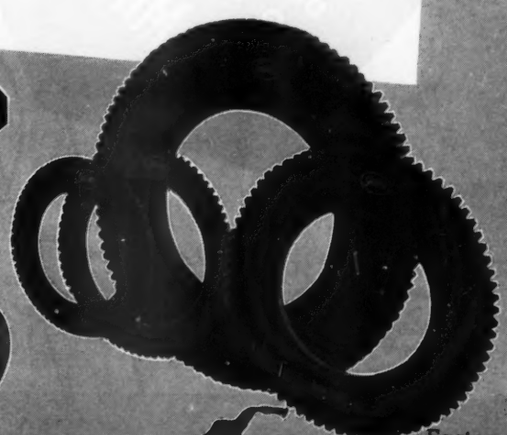
Through intensive development work we shall continue to keep pace with your progress in order that GATKE Materials shall not be found wanting . . . whatever your needs.

Even now, new testing equipment of our own design, that greatly excels anything we have ever seen, is being installed for your further advantage.

Our manufacturing facilities are being expanded to expedite delivery of your requirements through the turbulent times which are upon us.

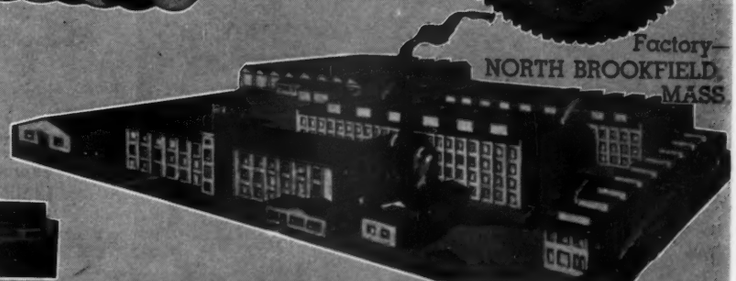
These are some of the steps which we hope will contribute to your future progress.

Thomas L. Gatke



Factory—
WARSAW, IND.

Factory—
NORTH BROOKFIELD, MASS.



GATKE CORPORATION

228 N. La Salle St., Chicago, Ill.

Originators and Manufacturers of Superior Friction Materials Since 1914.

You "GET A BREAK" with STANDCO BRAKES

Here's a record to be proud of

78 STANDS OF 4½" AND 3½" DRILL PIPE RUN IN TO 7006 FEET IN 78 MINUTES

BENDER DRILLING CO.
CONTRACT OIL WELL DRILLING
Mailing Address: P. O. Box 52 Bakersfield, Calif.
1315 30th STREET
BAKERSFIELD, CALIF.
BUSINESS PHONE 375
2598 DAWSON AVE.
LONG BEACH, CALIF.
TELEPHONE 434-88

February 14, 1941

Cardwell Manufacturing Company, Inc.
P. O. Drawer 2001
Wichita, Kansas

Gentlemen:

We are glad to send this report on our "Cardwell" Model S twin-engine draw works.

First, let me say we are very pleased with the entire set-up, especially as the rig drilled this well to 7,006 feet. This is 2,000 feet beyond your recommended depth with Waukesha GAK engines.

The drillers liked the draw works from the start. It is light and compact, even with both engines assembled, making rigging up much easier. The air-cooled clutch, even-step transmission and Hi-Speed drive saved them much time and effort.

In checking the round trip time, the following results were obtained: at 7,006 feet, we had 45 stands of 4-1/2" and 33 stands of 3-1/2" drill pipe in the hole. We pulled a stand every 2 minutes and 20 seconds in low gear; 2 minutes in second gear; 1 minute and 50 seconds in third; 1 minute and 15 seconds in fourth. Coming out at 7,006 feet we pulled 15 stands in second gear; 21 in third; 22 in fourth and 22 in fifth. We cannot give you the exact time as we had to stop at intervals to change tongs, etc., but as near as we could figure, it took 2 hours and 20 minutes to pull out from bottom, 7,006 feet.

Going in, we ran at the rate of one stand per minute average all the way, or 78 stands in 78 minutes. The drillers all agreed that the brakes are the best they have ever used, as they held the load nicely even at 7,006 feet.

We hope this report will be of value to you, and remain,

Yours very truly,

E. A. Bender

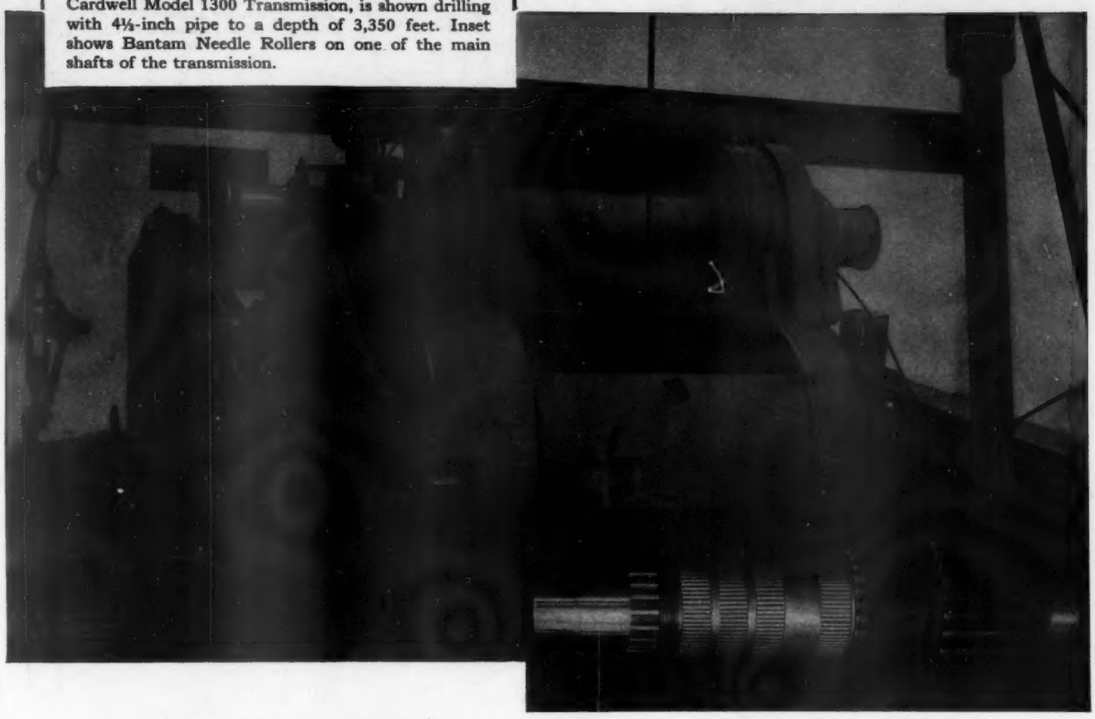
EAB:BB

Below — The STANDCO equipped "Cardwell" Model S twin-engine draw works which established the record referred to in Mr. Bender's letter.

THE LETTER from Mr. E. A. Bender tells its own story and adequately expresses the enthusiastic acceptance which STANDCO BRAKE LININGS meet among production men throughout deep well areas. Extensive experience of major companies and contractors demonstrates that STANDCO non-metallic brake blocks eliminate 90% of the scoring, and last longer. There has not been a single case of the brake blocks coming loose on the bands. STANDCO BRAKES are a product made especially to answer the oil field braking problem . . . they are not an industrial brake adapted to oil field use. That's why drillers prefer STANDCO.

STANDCO BRAKE LINING COMPANY

2701 CLINTON DRIVE ★ HOUSTON, TEXAS



This Model R double drum draw works, equipped with Cardwell Model 1300 Transmission, is shown drilling with 4½-inch pipe to a depth of 3,350 feet. Inset shows Bantam Needle Rollers on one of the main shafts of the transmission.

AIDING CARDWELL PERFORMANCE

Bantam Bearings contribute to successful operation of heavy-duty transmissions

Progressive design and efficient operation of Cardwell equipment are outstanding reasons for the company's success during its 15 years of service to the oil industry. Typical example of Cardwell design is the Model 1300 Transmission—a five-speed, even-ratio transmission built installation with heavy-duty prime movers, constructed throughout to withstand severe service.

Contributing factor in the efficient performance of the Model 1300 Transmission is the use of Bantam Needle Rollers on one of the main shafts. Providing exceptionally high load-carrying capacity in proportion to bearing size, these Needle Rollers offer the advantages of long bearing life and economical, power-saving operation. Cardwell has installed 41 of these transmissions in various types of rigs since October, 1939, and not a single case of bearing failure has occurred!

Performance of these bearings is typical of the ways in which Bantam Bearings and Bantam engineering are serving the makers and users of oil well equipment. Angular Contact Bearings for rotaries—Quill Bearings for saddles and pitmans on pumpers—Journal Roller Bearings for blocks and swivels—these are some of the other Bantam Bearings widely used by progressive equipment manufacturers. For bearings that will give high capacity, long life, efficient operation, *TURN TO BANTAM.*

BANTAM BEARINGS CORPORATION, South Bend, Indiana

BANTAM BEARINGS

STRAIGHT ROLLER • TAPERED ROLLER • NEEDLE • BALL

A Spicer 7440 Transmission mounted on a Cardwell Model H double drum draw works.

Spicer helps ~~CARDWELL~~ ALL STEEL deliver the goods!

The same rig as shown above, converted for cable tool operation.

IN rotary drilling, well servicing, rotary workover jobs, cable tool drilling, and other oil field operations, you'll find Cardwell delivering performance that constantly is making its 15-year record greater. • Spicer salutes Cardwell on its 15th Anniversary, and extends best wishes for ever-expanding success.

Spicer Manufacturing Corporation • Toledo, Ohio

38 YEARS OF Spicer SERVICE

BROWN-LIPE CLUTCHES and TRANSMISSIONS

SALISBURY FRONT and REAR AXLES

SPICER UNIVERSAL JOINTS

PARISH FRAMES READING, PA.

RESERVOIRS

That Will Stand The Test of Time . . and Conditions

Here's one of the industry's largest lease storage batteries . . . eighteen 500's and eight 750's pictured. But the battery keeps growing, and a recent addition of one 4-ring 2,000-barrel tank, two 1,000's, three 750's and four 500's raised the total capacity to 23,250 barrels. They're all Parkersburgs . . . bolted steel, 10-gauge material throughout, fabricated by Parkersburg's own unique method, erected by Parkersburg's own experienced crew.

This battery of tanks started with the first production in this section of the field and has "grown up" with drilling development. They'll be there, tank for tank, long after drilling development has ended . . . reservoirs of protection for hard earned oil. Like the many thousands of other Parkersburg tanks, they'll stand the test of time . . . and conditions . . . for behind them are 44 years of tank building experience.

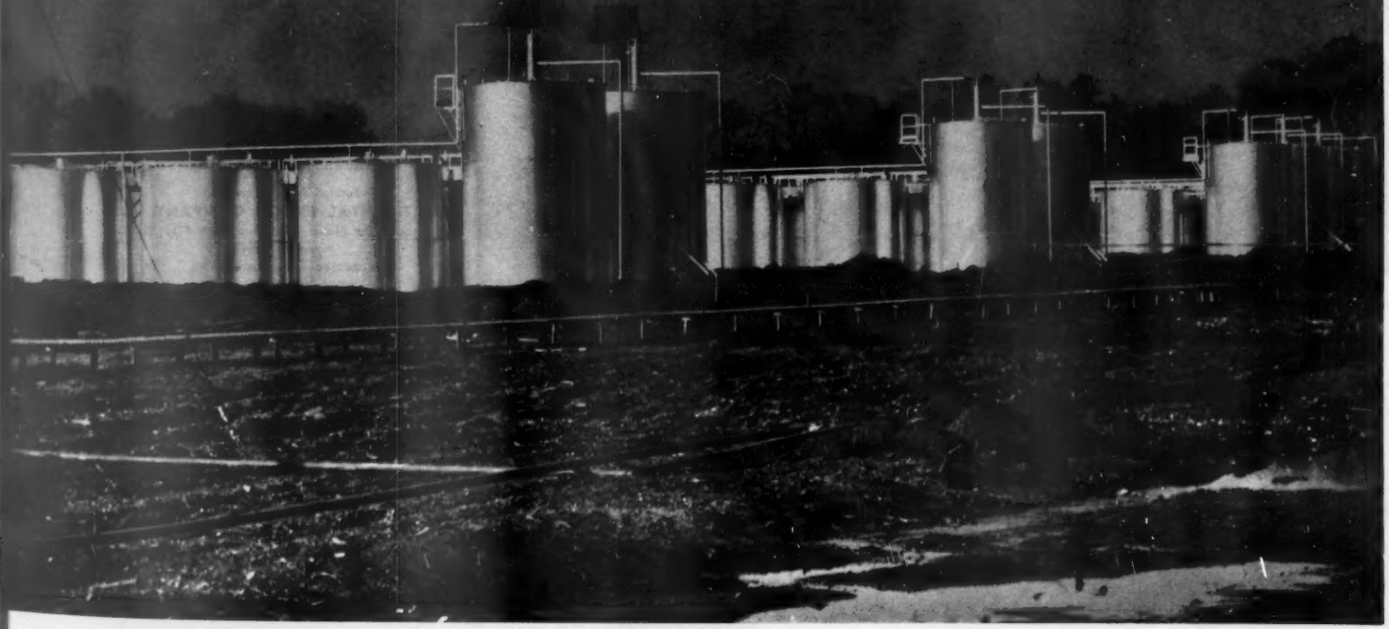
THE PARKERSBURG RIG & REEL COMPANY

PARKERSBURG, W. VA.

DALLAS HOUSTON TULSA LOS ANGELES NEW YORK

THE PARKERSBURG RIG AND REEL CO.

C-2-41



Designed FOR THEIR *Job*

LIKE ALL WESTCOTT VALVES

Hundreds of operators helped design these valves . . made by the only manufacturer devoted exclusively to valves for the oil and gas industries.

Westcott valves with their positive type wedging action make perfect closures against mirror-like stellite faced seats in perfect alignment. V-V type asbestos packing automatically adjusts itself to pressure, making a leak-proof seal. And you can repack Westcott valves under pressure, when fully opened or closed.

All these features and many more combine to insure you perfect control . . with less maintenance expense. We invite you to become one of the many operators who regularly specify Westcott.

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